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## ORIGINAL COMMUNICATIONS.

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## THROMBOSIS OF THE SUPERIOR THYROID VEIN FROM A CERVICAL ABSCESS, BETWEEN LARYNX AND THYROID. DIAGNOSIS MADE AT AUTOPSY.*

DR. HILL HASTINGS, Los Angeles.

Deep cervical abscess, the result of acute inflammation of the throat, has caused serious concern to the laryngologist largely because of the danger of death from edema of the larynx. Goodman (Annals of Otology, Rhinology and Laryngology, June, 1917) and later, Mosher, (THE LARYNGOSCOPE, June, 1920) have called attention (each, one case) to the unlooked for complication of thrombosis of the internal jugular vein. I wish, by the report of this fatal case, to make a contribution to this subject by calling to the attention of laryngologists the possibility of still another complication, *thrombophlebitis of the superior thyroid vein,* without involvement of the internal jugular vein.

According to Spalteholz (Atlas of Human Anatomy by Werner-Spalteholz, Vol. II, page 446) "The V. V. thyreoidea superiores, usually, two, accompany the artery only in part, one opens far below, the other above in the neighborhood of the A. thyroidea superior". The one that empties below, begins its course in the space between the postero-inferior angle of the larynx and the lobe of the thyroid gland, runs a long course downward close to the lateral wall of the trachea, enters the thorax under the clavicle; empties by

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way of a short trunk (the v. Thyreoidea Ima) into the V. Aonony-ma Sinistra, and thus into the V. Cava Superior.

The drawing, accompanying this report, is made from the plate in Spalteholz Anatomy, changed only in one respect, that the vein above described is darkened to show the thrombophlebitis that was found at autopsy. Had it not been possible to secure an autopsy in this case, the correct diagnosis would not have been made—a not uncommon observation. Furthermore, following the reports of Goodman and especially that of Mosher, to have opened the neck, before death, with a preoperative diagnosis of internal jugular thrombosis, would have resulted in failure for this vein at autopsy was found to be normal.

Permit me to anticipate the clinical history and autopsy findings by calling your attention to the unusually rapid progress of the disease in this case. In five days after I saw the patient he was dead. Three days previously he had had a chill, followed by a high temperature, and an acute hemorrhagic nephritis. His preliminary symptoms were unusually mild—slight soreness in the neck, about the level of the larynx, like the tenderness of a lymphatic gland so often found after a slight sore throat. Examinations by myself and other consultants failed completely to make out any cervical abscess, enlarged gland or induration of any kind, although the phlebitis and thrombosis was completely established.

Clinical history (by Dr. P. G. White) as follows:

Sept. 17, 1921, F. A., age 38 years. *Past History:* Has always been very robust except for tubercular pleurisy fifteen years ago. Has had no trouble in this respect since that time. Has had frequent colds. Bronchitis three months ago, cough persisting for some time. Was seen by Dr. P. G. White two months ago for cough. This gradually cleared up within a week or ten days. Examination of chest at that time was negative except for impaired resonance over the left chest posteriorly, probably due to an old thickened pleura. An occasional rhoncus was heard. Sputum negative for tuberculosis.

*Present Complaint:* Patient was feeling in his usual good health until Saturday, Sept. 17; went to business as usual. Complained of a slight soreness in the *left* side of the neck anteriorly. None of the symptoms of acute respiratory infection; in fact, had no other complaint except this soreness in the neck. On Sunday, Sept. 18, patient felt the same as usual with the exception that this pain in the left side of neck was a little more marked. Went to the beach Sunday

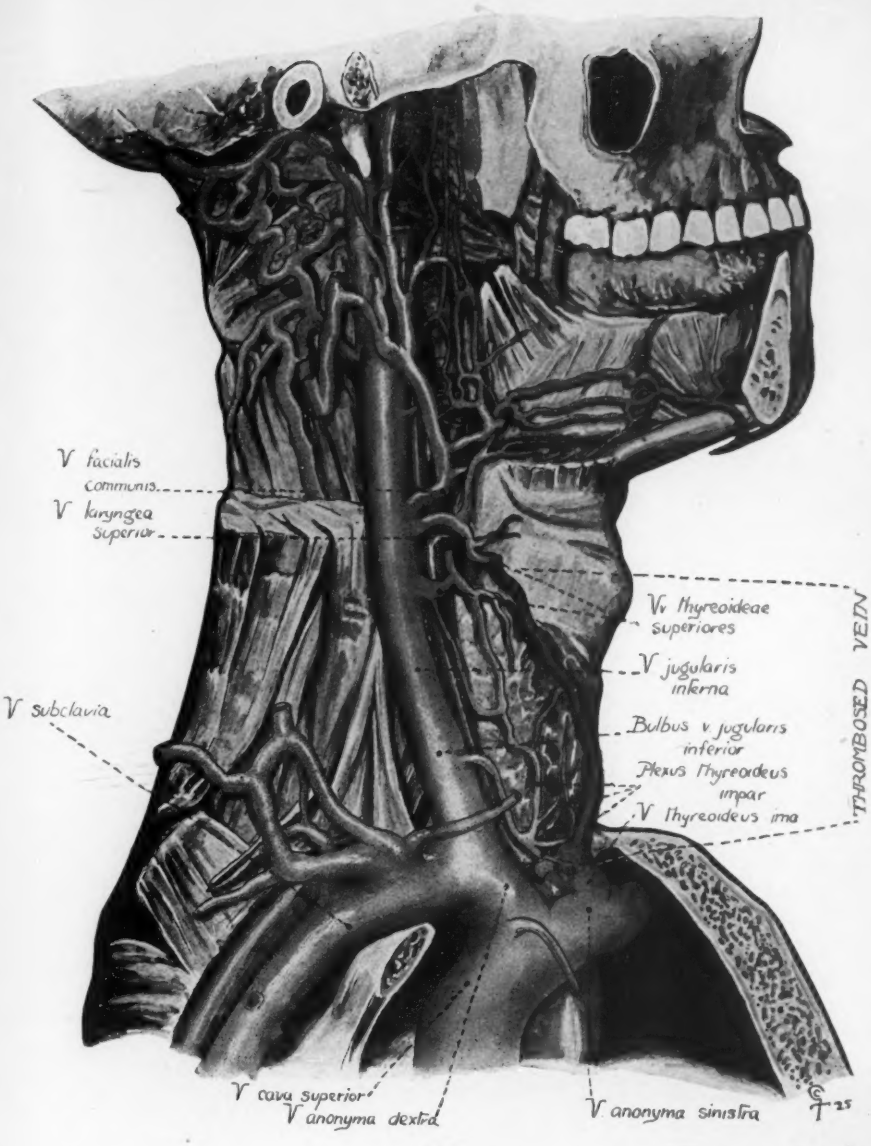
noon to attend a dinner party. While there the pain in the neck became very severe, spasmodic, sharp, shooting pains coming in the *left* neck anteriorly at the level of the thyroid, one or two inches external to midline. Accompanying this spasmodic pain their were severe contractions of the sternocleidomastoid muscle, which were relieved by patient throwing his head back. Remained at the beach during the day, returning home that night. Apparently had no fever, no sore throat, but had a slight huskiness of the voice, which cleared up with a slight hacking cough. Slept most of the night, although at times was awakened by this spasmodic pain. The next day was seen by Dr. White. Patient was having sharp, spasmodic, shooting pain in the left side of the neck anteriorly. Voice decidedly husky, but when clearing the throat was apparently normal; temperature normal.

*Examination* revealed marked tenderness on pressure over the tendon of the sternocleidomastoid muscle about 1½ inches above the clavicle. No sign of induration or palpable mass. Chest, negative; pulse, 76; heart, negative; nose, throat, larynx, negative; diphtheria culture, negative; ears, negative.

*Diagnosis;* at this time was inflammation of a deep-seated gland lying under the sternocleidomastoid which produced a spasm of this muscle. Origin of the infection was undetermined. Examined carefully for infection of the jugular vein but no evidence of such an infection could be found. Prescribed capsule containing 4 grs. of aspirin and 1-10th gr. of codein. Heat applied to neck. That evening patient felt more comfortable, although continued to have spasmodic pain, but less frequent and less severe than formerly. Later on in the evening while patient was playing cards was suddenly seized with a chilly sensation lasting 3 or 4 minutes. Temperature not taken at that time. Stopped playing cards, went to bed and asleep.

The next morning (Tuesday, Sept. 20) at 9 o'clock temperature was 99.° Had had a good night, very little pain or spasm. Tenderness over the area previously described persisted. There was also tenderness in the midline over what appears to be the isthmus of the thyroid. No swelling or induration to be felt anywhere. No general aching pains. No cough. Voice still slightly husky. Examination showed the upper respiratory tract to be negative. Heart was negative. Continued with capsules and heat to neck. At 3 p. m. nurse called on case. At 3 p. m. temperature 99.2,° pulse 88, respiration 20. At 4 p. m. complained of severe pain in the neck. Had

osteopathic treatment to back of neck during the evening. At 6 p. m. temperature 100,° pulse 88, respiration 20. Dr. Bowers (Dr. Hastings' assistant) made examination of ears and upper respiratory tract and could find nothing abnormal. Wednesday, Sept. 21, in the morning felt much better. Very little pain in neck. No spasm. Able to move neck from side to side and up and down without pain. examination revealed tenderness over the left side of the neck but less marked than the previous day. Tenderness over the isthmus of the thyroid still present. Huskiness of voice disappeared. Nothing abnormal found in throat. 7 p. m., temperature 99.6;° at 9 p. m., temperature 99,° pulse 80, respiration 20. At 1:30 a. m., temperature 99.6.° Had *second osteopathic treatment* to back of neck at *1:30 p. m.* At *3 p. m. had chill;* temperature 102.6,° pulse 88, respiration 20. At 4 p. m., temperature 103.8,° pulse 96, respiration 20. At 5 p. m., temperature 102.6.° At 5 p. m., when temperature started to go down, patient was bathed in *drenching sweat.* At 11 p. m., temperature 102.6,° perspiration still continuing. The pain in the neck had almost entirely disappeared. Tenderness, especially in the midline and over the sternocloidomastoid at the level of the thyroid, still present. No induration. That evening vomited. Complained of headache, chiefly temporal and frontal. No evidence of a meningitis, such as rigidity of the neck or photophobia. Pupils equal. No Koenig. No change in reflexes. Give 1¾ gr. of calomel and 15 gr. of aspirin. Urine micoscopically showed *blood* and *albumin.* Thursday, Sept. 22, had a restless night, *vomiting frequently.* At 1:30 a. m., temperature 101.6,° pulse 90, respiration 22. At 8:15 a. m., temperature 98.2,° pulse 76. At 8 a. m. had a *severe chill* lasting 35 minutes. Temperature rose to 101.3,° pulse 96, respiration 24. This was followed by profuse *sweating.* Temperature remained elevated until 3 p. m., when it was 101.8,° pulse 100. At 5 p. m. it was 99.8.° Saturday, Sept. 24, slept eight hours. Awakened at 5 a. m. with nausea and vomiting. At 6:15 a. m. had chill, which lasted nine minutes. (Heroin gr. 1-16 administered at onset). Temperature gradually rose, reaching 101.4° at 8 a. m., pulse 88. This morning for the *first time* patient complained of *soreness* in the *right side* of neck with very *definite tenderness* in the same region on this side of the neck as was formerly in the *left side.* (Sept. 24) Urine very *scanty* and *bloody.* Blood pressure 100/70. At 6 p. m., very *drowsy, vomiting,* temperature 101.° At 9:30 p. m., had a very *severe rigor* followed by an elevation of temperature to 106.2° (rectal), which fell to 102.8° by 12 o'clock and 99.4° (rectal) at 5 a. m., pulse 72, respiration 24.




(Drawing made from "Spalteholz Atlas")

Sunday, Sept. 25, soreness in the *right* side of the neck. Temperature at 9 a. m., 98,° pulse 80. 10:30 a. m., had a very *severe rigor* lasting 20 minutes. During this chill had acute pain in the left side of the neck over the sternocleidomastoid muscle. No radiation. Urine *still bloody,* freer. Following this chill temperature rose to 104.2,° followed by moderate sweating. Consultation with Dr. Hill Hastings, Dr. Geo. McCoy, Dr. Harold Smith, Dr. E. C. Moore, Dr. R. B. Hill and nothing tangible could be found to account for the *evident septicemic* condition and acute nephritis. Considerable *discussion* about the possibility of *opening* the *neck*. The consensus of opinion was strongly against doing so as nothing *definite could be found on examination.* During the afternoon temperature went down to 99.4.° Patient slept most of the time. That evening temperature went to 101.8,° but had no definite chill. Complained during the evening of neck being very sore on both sides. Urine much more free, voiding 53 oz. in twenty-four hours. Leucocytes 13,200, polys 91 per cent. On three or four occasions during the following three days, patient had slight cough and expectorated a small quantity of tenacious, bloody mucous, the blood being right. Condition gradually grew weaker, no new symptoms developing, and on Sept. 29 the patient died.

*Laboratory report:* Urinalysis: 5th day, Sept. 22, 1921, F. tr. alb. and mucous, otherwise negative. Sixth day, Sept. 23, trace of alb., hyalin and granular casts. Otherwise negative. Seventh day, Sept. 24, very smoky. Loaded with r. b. c. and blood casts. Ninth day, Sept. 26, heavy trace of alb. Trace of bile. Loaded with r. b. c. Tenth day, Sept. 27, trace of bile, many r. b. c. and casts.

Blood: Wassermann done at another laboratory was negative. Fifth day, Sept. 22, leucocyt. 5,800, polys. 93, lymphs. 6, monos. 1, trans. none. Sixth day, Sept. 23, leucocyt. 8,600, polys. 92, lymphs. 6, monors. 1, trans. 1. Eighth day, Sept. 25, leucocyt. 13,400, polys. 96, lymphs. 4, monos. none, trans. none. Tenth day, Sept. 27, leucocyt. 19,000, polys. 88, lymphs. 10, monos. 2, trans. none.

My examinations were absolutely negative, except for small, chronically infected tonsils. There was no pathological condition found in the throat, larynx, trachea, nose and paranasal sinuses or ears. The patient was normally very thin; the neck, long and thin, permitted unusually good palpation. There were no enlarged glands; no induration along the trachea from the larynx down where the tenderness was so acute. At my first examination the cervical tenderness was on the left side; later on the right side, elicited by pressure on the lateral wall of the trachea. This physical sign, together with

the expectoration of bloody secretion on two or three occasions during the illness gave rise to a probable diagnosis of a tracheal ulceration, which was ruled out.

Post-mortem examination of body (by Dr. R. B. Hill):

"General Appearance—The body is that of a large framed, moderately well nourished, young adult male. There is a distinct lemon tint to the skin. Two old inguinal scars. No other markings.

"Peritoneal Cavity—There is no free fluid and nothing abnormal noted.

"Pleural Cavities—Pleura of both lungs covered by thin, fibrinous adhesions. Many old adhesions in the left side.

"Pericardial Cavity—Contains about 75 c.c. of clear fluid. The layers are roughened and covered by a fibrinous exudate similar to that in the pleura.

"Heart—The heart is about normal in size. The muscle is soft and pale. The endocardium is smooth. The *valves* show no evidence of *disease*.

"Lungs—Both are edematous and markedly congested. There are several old *healed* tubercles in the *apex of the left lung*. The bronchi are congested.

"Liver, stomach and duodenum—The liver is larger than normal and shows a very marked acute passive congestion. The stomach is filled with clear fluid, the mucosa is congested. The duodenum does not show any changes.

"Intestines—The intestines, especially the jejunum, have a very dark colored appearance and are filled with a semi-clotted bloody material. The mucosa is markedly congested but there are no ulcerations. The *Peyer's patches appear normal*.

"Spleen: The spleen is one-third larger than normal, is firm and the capsule is somewhat thickened. On section the pulp is soft, dark reddish brown in color and seems to contain an abnormal amount of blood.

"Kidneys—The kidneys are about equal in size, *markedly swollen* and on section are quite *dark in color* throughout; the cortex is swollen; the capsule strips readily, leaving a smooth surface over which are many *small punctuate hemorrhages slightly larger than a pinpoint*.

"Ureters, bladder and prostate—Show no evidence of disease.

"Neck—On dissecting the muscles from the thyroid gland the thyroid veins are seen to be distended, dark in color and quite *rigid*. On opening the veins they are seen to be filled with a thick, rather dark watery pus. The thyroid gland seems normal. Just behind the upper pole of the left lobe of the thyroid gland is an abscess which contains about 15 c.c. of dark, thin, watery pus, which has a fetid odor. The *abscess* walls are formed by *the triangle* of the thyroid gland, esophagus and trachea, the upper margin being at the level of the cricoid cartilage. The *wall of the esophagus in contact* with the abscess is necrosed almost down *to the mucosa*. There are no evidences of ulceration in the esophageal mucosa or the mucosa of the trachea or larynx.

"The internal jugular veins are normal."

The cervical abscess found at autopsy was believed to be an old tubercular gland, reinfected by pus organisms from a chronically infected tonsil, or from a mild (clinically) pharyngitis or laryngitis. From this abscess, thrombophlebitis of the superior thyroid vein resulted, with rapid dissemination of septic emboli throughout the body.

As to the operative indications and the possibility of having prevented by operation the fatal sequelae, the lesson from the autopsy was that this patient's life could have been saved only by searching for a septic focus early in the course of the disease. At that time he did not seem to be sick. His first chill, in the light of the autopsy, is believed to be the result of a shower of septic emboli, which lodged in the kidneys, pleural and pericardial cavities. The possibility of a cure by operation was then too late. The shifting of the pain and tenderness from the left to the right side of the neck was, of course, confusing. This was explained only by finding at autopsy the thrombophlebitis of the descending superior thyroid vein.

# RETROBULBAR NEURITIS ATTRIBUTED TO SINUS DISEASE; IMPROVEMENT FOLLOWING INTRANASAL SURGERY. REPORT OF A CASE.*

DR. GEORGE L. WHELAN, Philadelphia.

This paper does not attempt to solve the problem of the treatment of retrobulbar neuritis of sinus origin; neither can it be claimed that it offers anything new in reference to the etiology, pathology or treatment of the condition under consideration. Its chief object is to present as impartially as possible the data advanced by certain writers, since rhinologists differ in their views regarding retrobulbar neuritis and especially with reference to its treatment.

A knowledge of history is a most distressing thing, for it discloses persistently that one or another supposedly new discovery is in reality only a rediscovery. We must take consolation in the fact that generally the first steps in a new field were but halting ones and were not backed by sufficient force of actual knowledge to permit the early investigators to reach their goal and hence our newer progress on a more substantial basis is after all the only worth while advance.

That the sphenoid sinus or ethmoid cells when diseased may cause an optic neuritis was recognized in 1892, when Caldwell reported a case of optic neuritis due to sphenoid and ethmoid disease, and Krause, in 1895, reported three cases of retrobulbar neuritis, supposedly due to an extension from sphenoid sinus disease.

*Pathology:* While it may seem elementary to review the pathological anatomy associated with retrobulbar neuritis, we are giving a brief résumé, even at the risk of repeating facts well known to many.

The optic nerves occupy a vulnerable position in the presence of suppuration in the posterior nasal sinuses. Postmortem examinations bear out the contention that sphenoidal sinus disease is by no means an uncommon affection. From an anatomic standpoint, it has been shown that the optic nerve bears no constant anatomical relation to the sphenoid sinus and posterior ethmoidal cells. It would seem that the easiest route for the propagation of an inflammatory affection of the sphenoid sinus is directly by way of the thin bone of the sinus wall—by way of strands of fibrous tissue and small veins which run through the bone of the sphenoidal walls. Another possible route

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of direct extension is by way of the carotid tract. We must also bear in mind the possibility of direct absorption of products from the sinuses through the roof as well as through the lateral walls into the arachnoid cavity, and by this path to the nerves, or by hyperplasia of the sinus, which is described by Skillern[1] as a rarefying ostitis associated with an inflammatory swelling.

It is not impossible for an infection producing little or no change in the macroscopic appearance of the sinus mucosa to cause a neuritis in the more delicate and less resistant structure of the optic nerve. Young[2] states that in thirty sphenoidal sinuses dissected from the base of the skull in the recent state, in unselected cases at necropsy, there were in four cases one or more hiatuses in the bone separating the optic nerve from the sinuses, while in one specimen there was more hiatus than bone. It is quite possible that the nerve in such cases would be involved in an infection of the sinus mucosa. As the optic nerve in its canalicular course is separated only by a thin bony plate, often with dehiscences from the sphenoid sinus and posterior-superior ethmoid cells, it is easy to understand how it may be affected by disturbances in the neighboring sinuses.

Syme[3] does not now consider it necessary, before undertaking operation, to find pus in the superior nasal meatus. If there is a suggestion of crowding in the upper part of the nose, whether the crowding is by the septum or by an enlarged or unhealthy turbinate, he considers that operation is indicated.

One may be reasonably sure that in cases of optic nerve involvement, where other possible sources of infection, such as teeth and tonsils have been eliminated, operation on the sinuses will prove successful in a large proportion of the cases.

Most cases of retrobulbar neuritis, particularly those unilateral in type, have their origin in disease or suppuration of the sphenoid sinus. Holmes[4] says 40 per cent of eye diseases have their origin in diseases of the nasal sinuses. The visual changes which have been noted in this condition are recorded by Tranquair[5] as follows: *1* Changes reported as occurring in patients whose symptoms have brought them in the first instance to the rhinologist, who passes them on to the oculist. The visual changes are usually not complained of but are found on proper examination. *2* Changes found by the oculist in patients complaining of visual symptoms and headache, and in whom sinus disease is subsequently discovered by the rhinologist.

Stark's[6] classification of the pathology of retrobulbar neuritis resulting from sinus conditions is as follows: Infection of one or

more of the nasal sinuses, usually the posterior group, with interference of drainage, through the natural opening caused by anatomic obstruction, or by swelling. This condition may exist for years and result in thickening of the mucus membrane, the development of a periostitis, an osteosclerosis or an osteoporosis. He advances a new theory as to the pathology of sinus disease, *i. e.*, the sensitization of the tissues of the sinus by bacterial proteins producing an allergy, which results in a localized anaphylactic reaction each time the individual comes in contact with a fresh infection of the nose; which together with any variation in the normal anatomy of the nasal sinuses brings them in closer relation to the optic nerve, resulting in an optic neuritis.

*Diagnosis:* The diagnosis must be considered from the standpoint of eye symptoms and from that of pathological conditions of the nose. Total optic neuritis is generally a complication associated with suppuration of the posterior sinuses. In the nonsuppurative cases there may be retrobulbar neuritis with vague disturbances of vision. There may be pain on ocular pressure, or paracentral scotoma, with enlargement of the blind spot.

The changes most often reported in patients who have been examined first by the rhinologist are enlargement of the blind spot, peripheral contraction of the visual field and central scotoma, but the exact relationship of these findings to the associated nasal sinus disease remains as yet undecided. Important as are scotoma and enlargement of the blind spot, they are not symptoms of sinus disease, but of optic nerve affection. They show us that the optic nerve is diseased, but they reveal nothing as to the origin of the infection. We must not lose sight of the fact that every retrobulbar neuritis may begin with these symptoms, whether due to multiple sclerosis, syphilis or tuberculosis.

The eye symptoms are the first to attract the patient's attention. When the ocular change comes on suddenly and is pronounced, the diagnosis can be made more readily than if the onset of the symptoms is slow and progressive. Rhinological examination rarely reveals pus, polypoid changes or a history of nasal discharge. If on examination, a slight departure from the normal is found, such as a slight increase in moisture, a congestion of the mucosa on one side, a little edema of the middle turbinate, hypertrophy of the middle turbinate or deviation of the septum, this is enough pathology to cause neuritis.

White,[7] in a series of thirty-three cases, found a deviation of the septum pressing on the middle turbinate with hyperplasia of that part

as the most important pathology. Grant[8] records two cases of retrobulbar neuritis in which the affection subsided after removal of hypertrophied middle turbinate bodies.

When there is a direct extension of the infection from the sinuses to the sheath of the nerve, and also in cases of toxemia from infection in the sinuses, a diagnosis may be made by rhinologic examination and X-ray findings. Optic neuritis as a result of hyperplasia, however, is very difficult to diagnose as intranasal examination shows little pathology and as a rule the roentgenologic findings are negative. In such cases, if all other possible causes can be excluded, one is justified in operating on the posterior ethmoids and sphenoids.

We recognize the fact that sinus conditions can cause the above-mentioned eye findings, because cases are recorded in which enlargement of the blind spot and central scotoma were found, and in which these conditions decreased or vanished after treatment of the sinus affection and recurred with each subsequent infection of the sinuses.

The problem before us at the present time is the building up of a clinical picture of rhinogenic retrobulbar neuritis. It will be necessary to collect all the facts in regard to history, age, sex, mode of onset and associated symptoms, while the progress and subsequent history of cases coming under observation should be watched indefinitely.

*Prognosis:* It may be well to analyze the term "prognosis", by which we understand the prediction of the course of a disease. It is possible to make a prognosis only when we have exact knowledge of the disease itself, the condition of the diseased sinus, and the influence of the treatment. Briefly, then, we may say that the prognosis depends upon how long the condition has existed previous to the time when the patient presents himself for examination, how far the blindness has advanced and the promptness with which the condition is recognized and operation is performed.

Gallagher[9] says that atrophy of the optic nerve can occur within fifteen to twenty days from the beginning of its involvement; therefore examination should be made promptly and no time should be lost before operation. If the condition is caused by toxic absorption, edema, stasis, slight inflammations, or slight pressure, and is recognized early, the outlook is favorable. If, on the other hand, the affection is of long standing with the possibility of more extensive inflammation, the prognosis is decidedly unfavorable.

The operative procedure must be suited to the particular case. Conservative measures may give relief in some cases; perhaps it may

be well to try the intranasal conservative measures first. If they do not afford relief one must then resort to the more radical procedures. However, when such patients are seen by rhinologists, the general trend seems to be to act promptly—to remove deviated septa, middle turbinates which appear to be diseased, and posterior ethmoidal cells and to open the sphenoid sinus.

*Report of Case:* G. U., a woman, age 23 years, referred to Dr. Ross H. Skillern's clinic, Medico Chiurgical Hospital, Nov. 29, 1923.

Diagnosis, monocular left optic neuritis. Right fundus negative.

X-ray findings, frontal sinuses clear, ethmoids both sides occluded with exudate. Sphenoids clear. Right maxillary sinus opaque, probably occluded with exudate. Blood Wassermann negative. Urine analysis negative.

*History:* Pains over left frontal and occipital regions for past six weeks. Field report of the left eye by Dr. Monroe showed marked enlargement of the blind spot and a large scotoma in the upper nasal quadrant. The form field showed a notch in the upper nasal quadrant almost merging with the top of the scotoma. The fields for color were markedly cut.

Rhinoscopic examination disclosed a hypertrophied left middle turbinate. Antrum puncture is negative. It was impossible to probe the sphenoid cavity. Immediate operation was advised by Dr. Griscome, and on Nov. 29, 1923, middle turbinectomy was performed under cocain-adrenalin anesthesia.

After this operation the field showed some slight improvement, which was followed, however, by a rapid increase in the blind area.

*Dec. 28, 1923:* The posterior ethmoid cells were exenterated and the anterior sphenoid wall was punched out. The fields were examined weekly and the affected one showed steady improvement until Mar. 5, 1924, when it was noted that the blind spot was still somewhat enlarged and that there was a narrow relative scotoma extending upward and inward from its upper border. The form field was full; the color field showed a cut in the upper nasal quadrant.

*Mar. 12, 1924:* Rhinological examination revealed a curtain-like covering of mucous membrane over the anterior sphenoidal wall. This was removed, with the hope of restoring the visual field to normal. There was little change, however, effected in the field as a result of this attempt.

*July 1, 1924:* Examination of the left ocular field showed blind spot slightly enlarged. Two small absolute scotomas had replaced the relative scotoma. The form field was full, but the color field still showed a cut in the upper nasal quadrant.

It is of interest to note that with each fresh infection of the nose, or when she was depressed or fatigued from loss of sleep, worry or a menstrual period, marked changes were observed in the field, which always showed improvement after treatment and rest.

## CONCLUSIONS.

Every case of retrobulbar or intraocular neuritis, which does not show improvement under general or local treatment, should be submitted to surgical treatment without further delay.

Co-operation between the ophthalmologist and rhinologist after a roentgenographic examination has been made would seem to be the logical procedure in all cases of optic nerve change, regardless of the cause.

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# FOCAL INFECTION AS A FACTOR IN THE PRODUCTION OF NEUROLABRINTHITIS. REPORT OF TWO CASES.*

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Of the twelve cranial nerves there are two which seem to be peculiarly susceptible to toxic productions. They are the optic and the auditory nerves. These toxic products may be either of endogenous or exogenous origin.

The exogenous toxic substances are those such as lead, arsenic, mercury, quinin, the salicylates, illuminating gas and wood alcohol, although wood alcohol shares a greater selective affinity for the optic nerve.

The endogenous poisons are produced within the patient's own body, as a result of bacterial morphology. Such conditions as diseased teeth and tonsils, chronic pathologic processes with pus formation and retention in any of the organs of the body, lues, diphtheria, the various exanthemata and the infectious fevers are capable of causing neurolabyrinthitis of the eighth cranial nerve.

The reason or reasons why wood alcohol generally affects the optic nerve and quinin the auditory nerve has not as yet been explained. Neither has the fact that focal infection of the same type may spend its greatest force upon the auditory nerve of one individual and upon the optic nerve of another. Frequently the same person gives a history and presents clinical evidence of first having had the second cranial nerve affected, and subsequently had this followed by involvement of the eighth cranial nerve or vice versa.

Does it not seem reasonable to expect chemistry to solve this problem of the selective affinity of certain provocative causes? Perhaps this may lead us to the endocrines and their effects in the production or prevention of diseases. But this is theorizing and theorizing is fraught with dangers to the investigator, for it frequently causes him to roam far afield and leaves him lost in the wilderness of his own creation.

The relation of focal infection to the production of neuritis in the auditory nerve is becoming better understood. The general medical man is more on the alert and he recognizes the importance of careful diagnosis in the patient with vertigo or diminished hearing or both.

Where the condition has been found to be due to conditions in or about the teeth, another problem has had to be overcome. All too frequent do dentists fail to extract teeth in a thorough surgical man-

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ner. It is not sufficient in a case of advanced periapical abscess to merely extract the tooth. In addition, if good results are to be expected, the diseased socket of that tooth must be thoroughly cleaned up by means of the curette until healthy structures are encountered. Until otologists have secured this painstaking co-operation from the dentists, there will be frequent failures to obtain the maximum amount of relief following dental procedures.

This is but another fact that shows the necessity of dentists first being trained as medical men and subsequently selecting dentistry as their specialty. Already this is required in Italy and France—the necessary laws having been passed.

Two cases are offered for consideration:

*Case No. 1.* Male, age 74 years; office record No. 5958. First examination Sept. 26, 1924. The following is the history obtained from both the patient and his wife together with the findings at the time of the examination: Mr. P., according to his wife, has used the Politzer bag for a good many years with a great deal of benefit. About eight years ago patient had a tooth extracted, upper left back tooth, presumably for pyorrhea. Following the extraction the patient developed empyema of the antrum, which drained from the socket of the extracted tooth. Later he had retention symptoms with the drainage of pus through the nose. The attending physician later drained the antrum through the inferior fossa. Since that time patient has had no trouble of this kind. Descriptions of dizziness by his wife, who is a physician—came on one morning. The nystagmus was very pronounced. The first day nystagmus was to the left, horizontal. The following day it became rotary. Dizziness lasted three or four days. Last winter patient, in walking, would stop and grasp wife and say he was dizzy. This would last but a few seconds. During April extreme deafness came on in morning (left ear); lasted a few days and then hearing returned to normal, or as good as it was before. Five weeks ago nystagmus again set in. Between two and three weeks ago patient became totally deaf again, which lasted a few days and again came back to normal, or as formerly, but Mrs. P. feels that there has been some loss of hearing since first attack. Right ear deaf. Complains of headache (localizes it on left side of head (especially more severe on left than on right side. Pain seems indefinite. Patient has had ringing in ears of long standing, but the more deaf he is the more annoying are the noises.

Blood pressure systolic, 110. Urinalysis normal. According to Mr. P.'s attending physician, there is a "slight amount of arteriosclerosis", but this was thought allowable for patient's age.

According to Mrs. P. there is *1*, occasional subconjunctival hemorrhages; *2*, gradual loss of weight; *3*, "decided change of disposition, formerly good natured, lately gets brain storms", according to the patient's own opinion.

Blood pressure: Systolic 170; diastolic 115; pulse 55.

*Functional Hearing Test—Right Ear:* Conversational speech, not heard; whispered speech, not heard; acumeter, negative. Weber, not lateralized. Schwabach, normal. $C_1$, low fork, not heard; $C_4$, high fork, not heard. Air, not heard. *Left Ear:* Conversational speech, 5 meters. Whispered speech, not heard. Acumeter, ad conch. Weber, not lateralized; Schwabach, short 10 seconds; Rinne, positive 10 seconds; $C_1$, low fork, short 67 seconds; $C_4$, high fork, short 7 seconds; Air, short 20 seconds.

With noise producer in left ear and speaking tube in right, loudest conversational voice is heard 50 per cent. Ordinary conversational voice not heard. With noise producer in right ear and speaking tube in left, low conversational voice 100 per cent.

*Spontaneous Nystagmus:* Rotary nystagmus to right when looking to the extreme right. Rotary nystagmus to the left when looking to extreme left. However, the nystagmus to right is considerably more pronounced than nystagmus to the left. Very slight spontaneous nystagmus to right when looking straight ahead.

*Galvanic Labyrinthine Test—Right Ear:* With 2½ ma. Kathodal current the existing rotary nystagmus to the right was increased. With 5 ma. Anodal current a rotary nystagmus to the left was produced. *Left Ear:* With 4 ma. Kathodal current a rotary nystagmus to the left was produced. With 2 ma. Anodal current the existing rotary nystagmus to the right was increased.

*Turning Test—Head Erect:* After ten turns to the left there was produced a horizontal after turning nystagmus to the right lasting 33 seconds. After ten turns to the right, there was produced a horizontal after turning nystagmus to the left lasting 27 seconds. *Head Forward 90°:* After ten turns to the left a rotary after turning nystagmus to the right was produced lasting 27 seconds. After ten turns to the right a rotary after turning nystagmus to the left was produced lasting 22 seconds.

*Sept. 27, 1924; Additional History:* Patient's dizziness becomes more pronounced when he moves his head. More dizziness when eyes are closed than when eyes are opened. Also at night in bed when the lights are out complains of being dizzy. Can hear better when lying down.

*Sept. 29, 1924; Caloric Reactions:* Head erect, cold water in right ear produces rotary nystagmus to left side which continued for a few

minutes after stopping the flow of water. Patient's head was placed in horizontal plane, left side of head on top of table; in this position the rotary nystagmus to the left is changed to a horizontal nystagmus to the right (normal). Same findings when syringing left ear, but rather more pronounced on left side and patient spoke of being more dizzy.

*Otoscopic Examination A. D.:* General narrow vertically, but within normal limits. Membrane intact, brilliant, fairly opaque. Slightly retracted. By Politzer inflation there is free mobility posterior half and the rest slower, but within normal limits. *A. S.:* Membrane intact, brilliant, moderately opaque, but less than right side. Fairly normal mobility with Siegel. With Politzer inflation memberane came out over good sized area and returned.

Oct. 1, 1924: Additional History and Final Examination: Patient states he has had head noises which have never stopped since trouble began; like a high pitched hissing sound. They started after firing off a pistol fifty years ago. Patient says he has had catarrh since he was a lad. Hearing had been impaired in left ear before the above mentioned pistol shot.

*Functional Hearing Test—Right Ear:* Weber not lateralized, short 12 seconds; Schwabach, short 10 seconds; short 5 seconds. Rinne, not made; no air conduction. Air not heard. $C_1$, low fork, not heard; $C_4$, high fork, not heard. *Left Ear:* Schwabach, short 12 seconds; short 12 seconds. Rinne, plus-minus. Air, short 35 seconds, short 36 seconds. $C_1$, low fork, fairly short. $C_4$, high fork, quite short, short 18 seconds

With noise producer in left ear and 2 m. speaking tube in right, patient was unable to repeat loud conversational voice. With the speaking tube in left ear and noise producer in right, patient was able to repeat ordinary conversational voice, spoken 40 c.m. from mouth of tube.

*Spontaneous Nystagmus:* Very slight rotary nystagmus to right when looking to extreme right and to left when looking to the extreme left, but to neither side more marked than to the other. Very slight (less than 1 m.m.) at the equator, rotary nystagmus to right when looking straight ahead. *Head Erect:* After ten turns to the left a horizontal after turning nystagmus to the right was produced lasting 35 seconds; after ten turns to the right a horizontal after turning nystagmus to the left was produced lasting 28½ seconds.

*Galvanic Labyrinthine Test—Right Ear:* With 2 ma. Kathodal current the existing rotary nystagmus to the right was increased. With 4 ma. Anodal current the existing rotary nystagmus to the right was neutralized and swung to the opposite side. *Left Ear:*

With 4 ma. Kathodal current the existing rotary nystagmus to the right was neutralized and swung to the left. With 2 ma. Anodal current the existing rotary nystagmus to the right was increased.

*Eyes—Preliminary Examination:* Eyes move well and together in all directions without diplopia. Red cover test reveals no paresis of any of the extra ocular muscles. Convergence good. Stationary under cover for distance and for near. Tension normal O. U. Lacrimal apparatus normal. Ocular and palpebral conjunctiva slightly congested, no secretion. Complete arcus senilis O. U., otherwise cornea transparent and brilliant. Anterior chamber normal depth. Irides light blue, normal texture. Pupils round, black, equal in size, react promptly to light, accommodation and convergence and consensually.

*Ophthalmoscopic Examination—O. U.:* Media clear. *Indirect O. D.:* Disc quite round, sharply defined. Medium large, well defined cup extending to temporal edge. Suggestion of sclerol crescent temporal edge. Lamina cribosa discernible. Few scattered Drusen upper nasal equatoral region. Size and distribution of vessels normal. Fundus including the macular region normal, except for Drusen. *Direct* examination, same findings. *Indirect O. S.:* Disc elongated, axis 90,° sharply defined. Suggestion of crescents downward and outward. Large, fairly deep, well defined cup. Few small straw colored spots in macular region. Size and distribution of vessels normal. Fundus including the macular region normal. *Direct* examination, same findings.

Tension—Sept. 29, 1924: O. D. 7½ grm. weight—6 m.m. (21½ Hg); O. S. 7½ grm. weight—6 m.m.(21½ Hg).

*Comments:* This patient's dizziness is due to an irritative lesion (neuritis) of the right vestibular nerve and labyrinth. This is proven by the fact that it takes less than normal stimulation with the Kathode to increase an already existing nystagmus to the right side; and the patient's after turning nystagmus is lengthened on the both sides, but especially to the right. The functional hearing tests, particularly with the noise producer and speaking tube, revealed the fact that the right ear is completely deaf.

Neurological examination revealed no intracranial condition other than the neuritis of the eighth nerve. Radiographic examination showed the presence of advanced apical disease in several of his teeth.

The fields of vision are normal, or about normal. The binocular campimeter fields are normal. Besides, the ophthalmoscopic picture of the ocular fundi reveals a normal optic nerve. The absence of other intracranial nerve involvement together with normal functions

of the cerebellum excludes intracranial growth, plaques of degeneracy or hemorrhages. This case is thought to be due to focal infection resulting from diseased teeth.

*Case No. 2.* T. A., male, age 37 years, office record No. 5960. First examination, Sept. 29, 1924. The following is the history obtained from the patient together with the findings at the time of examination: Two years ago patient at times had a fullness in the right ear. This would make him dizzy. This dizziness was sufficient to cause him to lie down. Frequently he would vomit. He gives a history of injury to the right ear in 1917. (Hardly serious enough to fracture the temporal bone, judging from the patient's description of it.) Patient had his tonsils out and thought he was somewhat improved for a short time following their removal.

*Nose Examination:* Septum straight and flexible. After shrinking, right middle turbinate close contact goth sides. Left middle turbinate shows space both sides. Left inferior turbinate is moderately hyperplastic. There is free mobility of soft palate on phonation of the letter "E". Tenacious mucous between lateral wall and processus uncinatus on the right side. Right middle turbinate slightly puffy and red, probably the result of involvement of one or more of anterior group of ethmoid cells on the right side.

*Teeth:* Several teeth very much plugged. Upper left second molar gold crowned. Patient referred to Dr. J. W. Post for X-ray of teeth.

*Throat:* Tonsilar fossa clean. Tonsillectomy eighteen months ago.

*Functional Hearing Test—Right Ear:* Conversational speech, 8 m.; whispered speech, 4 m.; acumeter, 2.5 m. Schwabach, short 20 seconds. Rinne, positive 5 seconds. $C_1$, low fork, short 56 seconds; $C_4$, high fork, short 9 seconds. Air, short 37 seconds. *Left Ear:* Conversational speech, 8 m.; whispered speech, 6 m.; acumeter, 6 m. Weber lateralized to the left. Schwabach, lengthened 7 seconds; Rinne, positive 35 seconds. $C_1$, low fork, short 26 seconds; $C_4$, high fork, normal; Air, short 4 seconds.

*Otoscopic Examination, A. D.:* Membrane intact, brilliant, slightly retracted, slightly opaque. Hammer handle slightly narrowed pathologically. Mobility with Siegel quite normal. Politzer inflation—normal mobility and over a large area.

*Otoscopic Examination, A. S.:* Membrane intact, slightly dull, opaque, questionably retracted. Normal mobility with Siegel in that the hammer handle moves with the membrane. Politzer inflation—membrane came out over a large area and returned.

*Spontaneous Nystagmus:* No spontaneous nystagmus when looking straight ahead. When looking to extreme right there is a mixed horizontal and rotary nystagmus to right. When looking to extreme

left there is a mixed horizontal and rotary nystagmus to the left, equal to the two sides. (Physiologic.) No spontaneous nystagmus when looking straight ahead.

*Galvanic Labyrinthine Test—Right Ear*:* With 8½ma. Kathodal current rotary nystagmus to the right was produced. With 2½ ma. Anodal current a rotary nystagmus to the left was produced. *Left Ear:* With 6½ ma. Kathodal current very slight rotary nystagmus to the left was produced. With 6½ ma. Anodal current a slight rotary nystagmus to the right was produced.

*Turning Test—Head Erect:* After ten turns to the left a horizontal after-turning nystagmus to the right was produced lasting 16 seconds. After ten turns to the right a horizontal after-turning nystagmus to the left was produced lasting 20 seconds. *Head Forward 90°**:* After ten turns to the left a rotary after-turning nystagmus to the right was produced lasting 15 seconds. After ten turns to the right a rotary after-turning nystagmus to the left was produced lasting 20 seconds.

More dizziness followed turning with the head forward 90° than with head erect as occurs in all normals.

Sept. 30, 1924: Additional examination of the acoustic and non-acoustic labyrinth.

*Functional Hearing Test—Right Ear:* Schwabach, short 14 seconds; Rinne, positive 55 seconds. $C_1$, low fork, short 65 seconds; $C_4$, high fork, short 7 seconds; air, short 34 seconds. *Left Ear:* Weber lateralized to the left. Schwabach, normal. Rinne, positive 67 seconds. $C_1$, low fork, normal; $C_4$, high fork, normal; air, normal. (Variability of functional findings on different days is characteristic of neurolabyrinthitis of focal infection origin.)

When $C_1$ (64 DV) is heard on the right, patient describes it as of a higher tone than when heard on the left.

*Galvanic Labyrinthine Test—Right Ear:* With 7-9 ma. Kathodal current a rotary nystagmus to the right was produced (slight). With 3 ma. Anodal current a rotary nystagmus to the left was produced. *Left Ear:* With 4 ma. Kathodal current a rotary nystagmus to the left was produced. With 7-9 Anodal current a rotary nystagmus to the right was produced.

Galvanic findings on two different days practically the same and characteristic of right vestibular nerve involvement.

Minimal amount (2s. x 1 m.m.) nystagmus to right when looking to extreme right. Same to left when looking to extreme left. Both

*Very fine reaction which was not increased when using current strength up to 10 ma.

**First few jerks of the nystagmus were wide, these changed to very fine type of rotary nystagmus.

sides equal (Physiologic). Perhaps this physiological nystagmus is a trifle less than average normal.

No spontaneous nystagmus when looking straight ahead.

*Turning Test—Head Erect:* After ten turns to the left a horizontal after-turning nystagmus to the right was produced lasting 14 seconds. After ten turns to the right a horizontal after-turning nystagmus to the left was produced lasting 20 seconds (slightly more dizziness on left). *Head Forward 90°:* After ten turns to the left a rotary after-turning nystagmus to the right was produced lasting 15 seconds. After ten turns to the right a rotary after-turning nystagmus to the left was produced lasting 20 seconds.

Patient had eyes examined in 1917, but has never worn glasses. Vision, O. D. 6/6; O. S. 6/6.

Red cover glass test for the study of the action of the ocular muscles gives normal findings, *i. e.*, no extra ocular paresis.

Muscle test with Maddox Rod before O. D. reveals no vertical or horizontal muscle imbalance.

*Remarks:* This patient has aural vertigo from the description which he gives and the findings gathered. This combination together with the absence of paresis of any of the extra ocular muscles (which might produce a vertigo somewhat similar to the one he complains of) proves the case. The electrical reactions and after-turning nystagmus balance well, showing that the vestibular branch of the eighth nerve on the right side is involved. In the attempt to be accurate both the electrical and turning tests were repeated. Daily variations in reactions is quite possible in cases of this kind. The worse the patient's condition the greater Kathodal stimulation is necessary to produce a nystagmus to the right and the shorter will be his after-turning nystagmus, to the right. Also the shorter bone conduction together with the Weber to the left side shows perceptive apparatus deafness of the right side. In other words, both branches of the eighth nerve are involved. In unilateral involvement of the eighth nerve the first thing that is thought of by way of etiology is a focal infection. The patient's tonsilar fossae are clean and from the records there appears to be no focus of infection in any other part of his body, so the next logical place to look for it is about the teeth. The X-ray examination of the teeth puts the location of the patient's trouble there. It is believed the removal of the offending teeth, together with the surgical cleaning up of the sockets will bring about a prompt relief of the patient's eighth nerve, neuritis on the right side and possibly a partial restoration of some hearing.

1724 Spruce Street.

## A CASE OF "TONSILLAR" FISTULA.

Dr. J. B. H. Waring, Blanchester, Ohio.

Mrs. I. M. S., aged 39 years, married; came to my office with request that I "clean out a tube in her throat" that was bothering her.

She gave a general medical history of diphtheria in infancy; scarlet fever at 10 years of age; otherwise negative. Menstruation established at 14, and married at 20 years; on child was born eleven months after marriage; with two miscarriages after that. Says she had "peritonitis" fifteen years ago. At one time before this, says she did not menstruate for ten months, and supposed herself again pregnant. The abdominal enlargement, however, proved to be a phantom tumor, which lasted four or five months; this subsided suddently, with copious passage of gas by mouth and by rectum, so patient thinks this "phantom tumor" must have been a "gas tumor".

The left breast was removed about five years ago by a general surgeon, for what he told her was a tumor growth that would turn into cancer, in that breast. No recurrence to date. Also says she had some sort of a bloody tumor removed from her womb, which her doctor said was filled with "coffee grounds".

Is a large, well-developed woman, weighing about 150 pounds; and aside from incidents mentioned, says she has had good health most of the time. Menstruation has been regular for a number of years now, and no complaint referable to female organs. Is moderately constipated and inclined to over-eat.

Patient says she first noticed the trouble with her throat when about 15 years of age; at that time it was the style amongst her young girl acquaintances to wear a wide ribbon around the neck like a high collar; at times she noticed a spot on these ribbon collars, but paid little attention to it, as she had no pain or discomfort referable to the neck. At 17 she noticed at times a definite seepage of a thin watery fluid from time to time, coming from a small opening in the skin of her neck about a half inch above the clavicle, and slightly to the left of the midline of neck. The condition gradually became more noticeable, and in addition to the seepage from the neck opening, the side of her neck began to puff up at times and cause her pain and discomfort. Massaging of this swelling would usually relieve the pain, with discharge of a bad-tasting, offensive discharge into the throat, which she would spit up.

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Patient says she has seen many doctors, including throat specialists; says one prominent throat specialist commented that it was a "hospital case" but did not offer to operate. Another throat specialist of lesser repute, put some sort of an electric wire down the tube in her throat, to "burn it out;" but this was ineffectual, merely resulting in considerable swelling and severe pain for a number of days. Since then she has contented herself with visits to a doctor's office, whenever the neck began to swell and bother her, to have the tube in her throat "cleaned out" by swabbing and massage.

Examination of the nose, throat and ears was negative insofar as any definite pathologic lesion was apparent on inspection. The tonsils were small, rather ragged, and the seat of a chronic follicular tonsillitis; pillars were not adherent. Guided by patient's directions, however, a small blunt-pointed probe carried into the left supratonsillar fossa slipped in a fistulous tract back of the tonsil and just anterior to posterior pillar; followed down with careful probing, the fistulous tract led down the neck along the anterior border of the left sterno-mastoid muscle, to open through the skin at a point one-half inch above the clavicle and just external to the midline of neck. The skin immediately about the pinhead external opening of the fistula was brown pigmented, like a large freckle; and it was only after milking down the tract that a bead of thin, watery secretion could be expressed. Patient said the "tube" was usually cleaned out with cotton applicators dipped in peroxid.

Application of a tonsil suction tube to the left tonsil brought up a considerable amount of decomposed food debris and mucus; following this a fine silver cannula was carried down the tract and suction applied, with evacuation of a small quantity of brownish red glairy mucus.

Patient was advised to have tonsils removed; and then if the trouble persisted, to have the fistulous tract dissected out through skin incision. Operation was refused, however, patient being content to have the "tube in her throat cleaned out" from time to time, as this became necessary.

109 East Main Street.

# BRONCHOSCOPY AND ESOPHAGOSCOPY IN EVERY DAY PRACTICE AND SOME POINTS OF SPECIAL IMPORTANCE TO THE BEGINNER.

Dr. A. J. Shekter, Jamaica, N. Y.

Knowing full well that many more interesting cases have been reported, it is my object in presenting the following ten cases to merely emphasize the importance of endoscopy in every-day practice and to bring out some points at times overlooked in doing this work.

*Case 1:* E. H., age 5 years, male, referred to me by Dr. D., of Northport, for laryngeal examination. Mother gives history that, for the last two years the child has been continually subject to cough and hoarseness; that he had been treated for bronchitis off and on, given the usual family cough mixtures with no results. On direct examination, at the Huntington Hospital, multiple papillomata were seen springing from the interarytenoid tissues and the posterior part of the right cord. These masses were removed with forceps, the base cauterized. The patient got along fairly well, picked up in weight, cough disappeared, hoarseness improved, only to again recur in about six months. Repeated removals have been resorted to, various cauterizing methods tried, but still find this growth very obstinate in children. I would appreciate any suggestion as to the successful treatment of such cases.

*Case 2:* I. F., male, age 28 years, salesman. Chief complaint, hoarseness. Because of this was treated by the family physician with the usual sprays and medicants. The patient was referred to me by Dr. G. By direct laryngeal examination, at the Huntington Hospital, found a large single papilloma springing from the anterior commissure. This was readily removed and base cauterized. Hoarseness disappeared and voice remained perfectly normal since, which is about two years from date of removal. Re-examination showed no sign of recurrence of growth. Laryngeal papillomas in the adult when removed is less apt to recur than in children.

*Case 3:* Frances M., female, age 10 years, referred to me by Dr. D'U., of the Jamaica Hospital. History: While keeping an 1830 penny (a little larger than the size of a quarter) in her mouth, suddenly swallowed it. Thirty-six hours later began to vomit and

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complain of something in her throat. An X-ray and direct esophageal examination revealed the coin lying in the esophagus just below the cricopharyngeus muscle. The coin was readily removed. Note: Flat objects in the esophagus just below the cricopharyngeus is very apt to be passed over, especially where it is covered by the plicacricopharyngeus and tactile appreciation of contact lost after the tip of the tube has passed over the foreign body (Plate 1).

*Case 4:* Baby P., age 4 years, swallowed a quarter; four days prior to admission to the Jamaica Hospital. She had no symptoms

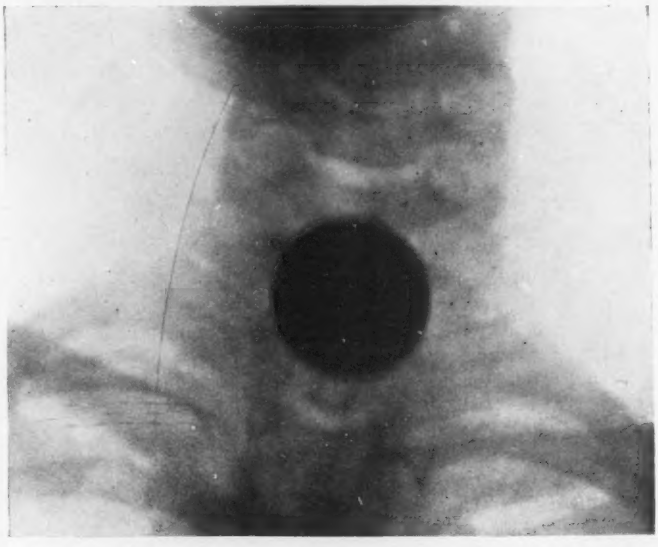

Fig. 1.

till the day of admission, then began to vomit. X-ray and direct esophageal examination revealed the coin in the same position as in Case 3. The coin was very readily removed (Plate 2).

*Case 5:* Mrs. W., age 40 years; came to the office saying she had swallowed a piece of bone mixed in some mashed potatoes, one day ago, and complained of a sensation of pressure and pain over the sternum. X-ray showed no foreign body in the esophagus or trachea. Direct esophageal examination, however, revealed an ulceration on the posterior wall of the esophagus at about the level of

the bifurcation of the trachea. This was touched up with a 25 per cent solution of argyrol and the patient sent home. The next day the patient passed the piece of bone shown in Plate 3. Note: Sensation of pain or foreign body may persist even after removal or passage of the object and is very often associated with ulceration; this happened also in the following case.

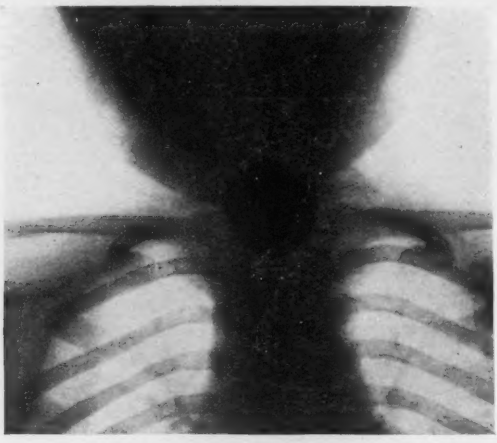

Fig. 2.

Fig. 3.

*Case 6:* Mrs. R., age 46 years. While drinking milk from a glass pitcher, suddenly felt that she had swallowed pieces of glass. She began to vomit and immediately went to her family doctor, who, she says, removed several pieces of glass from the back of her throat and that a little later, on coughing, expelled another small piece of glass. She still complained of something sticking in her throat. X-ray did not reveal the presence of a foreign body. Direct examination, however, revealed a slightly edematous cricopharyngeus

with a small ulceration posteriorly. Probing revealed nothing. Ulcerated area touched up with a 25 per cent solution of argyrol. The sensation of foreign body disappeared in a few days.

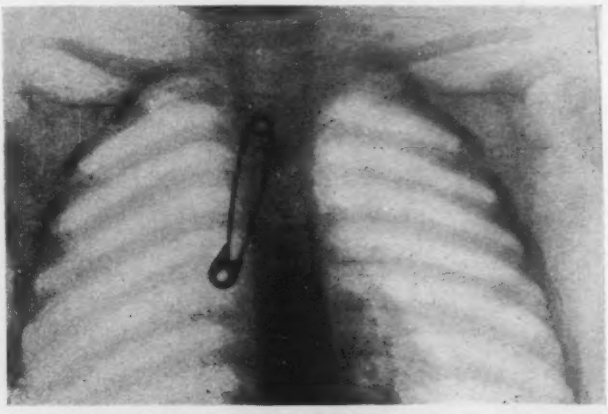

Fig. 4.

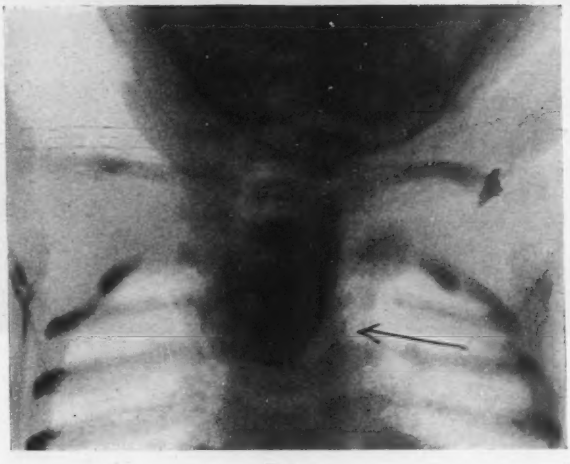

Fig. 5.

*Case 7:* Dorothy T., age 18 months. Referred to me by Dr. V., of the Jamaica Hospital. History: Mother believed baby swallowed a safety pin and becoming alarmed brought the child to the

doctor. Here the baby was fluroscoped and a large size safety pin, closed, was seen in what appeared to be in the esophagus. I was called rather late in the evening to remove the pin at the doctor's office, which I proceeded to do, but after several attempts trying to find the pin, even with the use of the fluroscope as a guide, gave it

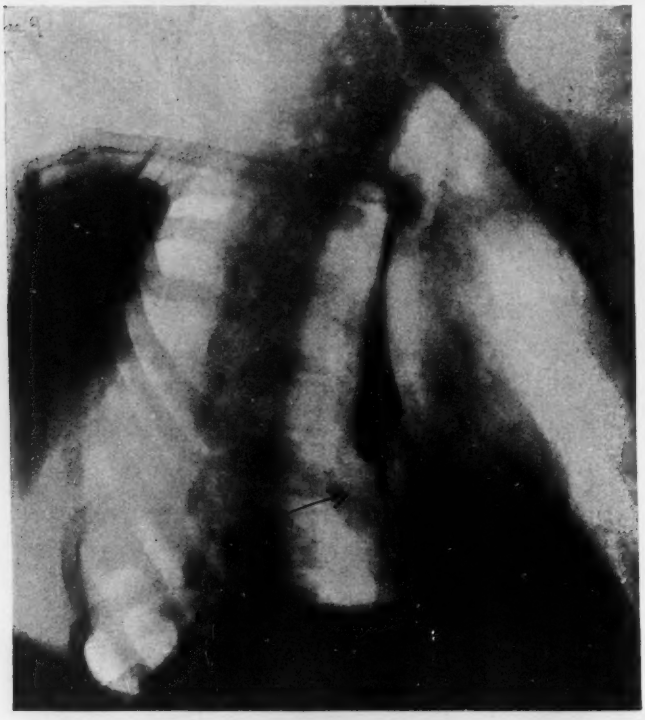

Fig. 6.

up and advised that the child be sent to the Jamaica Hospital where it could be X-rayed after a bismuth meal. This was done; the X-ray showed the pin pointing towards the right bronchus. The pin was then readily removed. The interesting thing about this case is that the child at no time showed any irritative symptoms leading towards the trachea or bronchi (Plate 4).

*Case 8:* Baby O'G., age 4 days, born at the Jamaica Hospital, was unable to retain any of the feedings for more than a few minutes. Believing that there may be some obstruction due to pressure of an enlarged thymus, the infant was X-rayed after a bismuth feeding. The picture showed bismuth in the upper third of the esophagus, but none below. On direct examination I found the upper third of

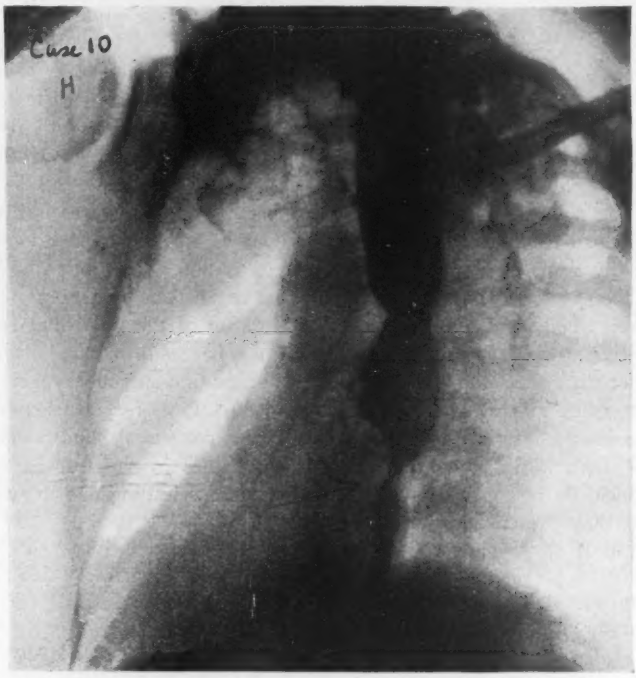


Fig. 7.

the esophagus to be much dilated and ended in a blind pouch. An autopsy performed four days later confirmed my findings. There was just a fine thread-like band extending from this blind pouch through the diaphragm to the stomach (Plate 5).

*Case 9:* Mr. R. S., age 40 years, referred to me by Dr. P. Patient gives a history of a progressive difficulty of swallowing foods,

first solids, then semi-solids and now even liquids. That he has lost about 50 pounds in the last six months. Bismuth meal and X-ray revealed an irregular constriction in the esophagus at about the lower third. On direct examination, at the Huntington Hospital, found constriction with infiltrated esophageal walls at the point shown in the X-ray. A diagnosis of malignancy of the esophagus was made (Plate 6).

*Case 10:* Mr. H., age 58 years. Admitted to the Jamaica Hospital, chief complaint being difficulty in swallowing, with a history about the same as in Case 9. The X-ray after a bismuth meal showed a marked constriction of the esophagus in its lower third with dilatation above. Direct esophageal examination showed marked infiltration of the esophageal walls at that point, with free bleeding during manipulation. A diagnosis of malignancy of the esophagus was made (Plate 7).

The points I wish to emphasize in presenting these cases is that laryngeal papillomata in the adult respond to treatment much more readily than in children; that pain or sensation of a foreign body in the esophagus may persist even after removal or passage of the foreign body and may be due to an abrasion of the wall; that flat objects, such as coins, buttons, etc., may be readily passed over, especially when they lie immediately below the cricopharyngeus; that when passing an esophagoscope in an infant, for obstruction, one should bear in mind the possibility of a congenital blind pouch, and that, lastly, nonobstructive foreign bodies in the trachea or bronchi do not always give irritative symptoms leading one to suspect their presence in those areas.

150-01 88 Avenue.

## NASAL TAMPON TREATMENT OF SINUS DISEASES.*

DR. J. IVIMEY DOWLING, Albany, N. Y.

The Gorgas idea has for its purpose the eradicating of disease and promotion of health. It may therefore rightfully be said that the subject of my address tonight meets up with that worthy object, for any method of treatment of the nose or accessory sinuses that will fortify these tissues against invasion of bacteria will go a long way to prevent disease and eliminate disease of varied nature that may already be present.

The development of the specialty, rhinology has passed through varied phases from poor and incomplete surgery to radical and too extensive surgery. Both methods have proven faulty and the results less successful than had been anticipated. For this reason there has gradually been evolved a group which has been endeavoring to develop some method of treatment which would not only cure many of the formerly incurable conditions but also promote the beneficial effects of surgery after it has been performed. The usual sweet scented sprays, irrigation, and nebulizing oils are a comfort to patients, but are only successful in cases in which there is little established pathology.

During an experience of some twenty-five years in the active practice of this specialty it has been the good fortune of the writer to develop a method of treatment that will not only quickly cure many of the acute sinus conditions, but is also applicable to the chronic states. Terry was the first to apply the term "Dowling method" to this measure which may be used for practical sterilization before operation, and also to enhance the benefits subsequent to operation.

The method to be described provides drainage and ventilation to the sinuses, improves the tone of the mucous membrane and subjacent erectile tissues, and makes possible the avoidance of a large per cent of the operative procedures within the nose or upon the sinuses.

Through its use it is also possible oftimes to avoid the radical procedures as the Killian and Denker operations. However, radical procedures of major nature when absolutely essential may, there-

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fore, be divided into two steps, lessening the danger from the operation, and rendering more likely a successful outcome after completing all the operative procedures which may have been required.

The first duty of the physician is to heal the sick and a good surgeon is even a better surgeon if he can eliminate a certain proportion of cases from the need of surgical procedure, providing equally good or better results can be obtained through less radical measures.

The experience of years permits the writer to make the absolute statement that his method of treatment, which has been given the name of Dowling method will cure a major number of the simple sinus conditions and a goodly proportion of the more difficult cases which have hitherto proven resistant not alone to treatment, but also to the usual surgery instituted.

The method to be described may be applied to the young child and to the aged adult with every expectancy of benefit. This opens to the specialist a very much broader sphere of usefulness, in that children during the period of development may be beneficially treated until such time as required operative procedures may be conducted with the best likelihood of success.

The casual person may say, "if a case is operative or appears likely to become operative, why not perform the operation at once even though at an early age"? It seems reasonable to believe that the good conformation of the face will be better accomplished if the parts are kept healthy and left to develop naturally than if bone elements, which are very necessary to mature development, are removed at too early an age.

Surgery upon the bony parts in a young child should be avoided except as a last resort and so a method which definitely accomplishes ventilation and drainage of the sinuses is well worth a fair trial by those interested.

The best health of the sinuses is possible only through free drainage and good ventilation and these may be attained through the Dowling method of treatment.

Healthy membranes heal more readily than those saturated with pathogenic organisms and so it only needs a little experience until a surgeon will employ this method before operating, and later after operation make use of it as a valuable aid in promoting the health of the membranes and the erectile tissues and thereby make them resistant to future infections.

Killian has reported operating upon a frontal sinus at the age of one year and three months, but this is a very rare need, although Davis in his recent work on the development of sinuses in children

has shown that sinuses may be present in size at almost any time, even before the age of seven years, this being the age after which the frontal sinus becomes most often a surgical possibility. The sphenoids develop but slowly and up to the age of seven are rarely to be considered as a surgical possibility and yet they become infected. Even though small in size they may become sources of trouble and in light of our known knowledge of focal infection may require drainage.

The difficulty of relieving any sphenoid disease at an early age through operation makes more necessary a knowledge of some better method for providing drainage for these cavities through the period of development.

All specialists are familiar with empyema of the maxillary sinus in the adult and approach treatment with considerable confidence, in that they can make an exploratory puncture beneath the scroll of the inferior turbinate and through irrigation secure results that are often times startling in their efficacy, but what of the young child in whom the sinuses are not fully developed? Here we have to consider the germs of the second teeth, which may readily be damaged because of some disease which has gained access to the maxillary sinus during its period of development and also the superficial relation of the dental nerves as they pass through this cavity and which become frequently irritated during the period before the second dentition, thereby occasioning referred nervous types of disease, such as phlyctenular ulceration of the cornea. These referred diseases are very resistant to treatment but are very materially benefitted through the use of the author's method of treating the sinuses.

This method of treatment renders unnecessary any exploratory puncture of the maxillary sinus in children except in the very rarest instances, in which there is a sizable cavity occupied by a various pathology necessitating even some more radical procedure than an exploratory puncture. The floor of this sinus is high in a child during its development and therefore the puncture must naturally be above the scroll of the inferior turbinate body, which will place it somewhere in the vicinity of the natural ostium through which the maxillary sinus normally drains and ventilates.

The ethmoid cells are possible sources of focal infection and are overlooked by many physicians and surgeons, and yet we know that these cells are numerous and readily recognized at time of birth as small pounches poorly drained and yet adjacent to the portal of entry of much infection through the nose.

Many adenoid and tonsil operations have seemingly been of less benefit than had been hoped, but the full benefits to be desired readily accrue after a course of treatment by tampon method for these tampons deplete the tissues and permit the carrying of the silver colloid to the parts which are important to reach.

Argyrol and other silver colloid solutions applied by means of tampons seem to precipitate the pus in the tissues so that it may be extracted by the induced attraction and affinity of one colloid for another, for instance pus is colloid and the silver solution is colloid.

Nasal tampons of silver colloids also induce a watery precipitation from the mucous membrane, thereby practically depleting the tissues of watery elements and by the induced flooding the bacterial organisms seem to be withdrawn from the tissues. The resident infecting organisms are thereby weakened by repeated argyrol tampon treatments and the virility of successive colonies of organisms is surely overcome until there is no longer further propagation of the pathogenic organisms.

Clinically this may be observed in the free pus ofttimes adherent to the tampons at the early treatments which is later followed by a ropy jelly of translucent kind, then later by ropy jelly of argyrol color and finally the tampons may be placed and left in situ almost indefinitely without irritation locally or subjective annoyance of any kind.

These observations may be practically interpreted and indicate the activity and progress of the disease associated with pus formation.

So long as the white or yellow stringy ropes of pus are to be observed virile infection is present. With the advent of clear transulent stringy ropes virile infection is largely overcome and immunization is in the process of being acquired. The presence of dark colored mucous strings or ropes indicate that the bacterial virulence is overcome and then there remains only an over-activity of the mucous glands or a noninfected catarrhal process, which through continued treatment may be reduced to a minimum. Under this treatment the erectile tissues are reduced in size and the mucous membranes become firm and resistant to infection. The lining of the accessory nasal sinuses is likewise affected and normal ventilation and drainage of the cavities established through the natural ostia.

The difficulties of applying remedies to the various groups of accessory nasal sinuses is generally recognized, and it was not until the development of colloidal preparations that any really successful method could be established, for the ordinary aqueous solutions were not satisfactory.

The advantages of the colloidal preparations are many, but one of the chief is that they are usually nonirritating, although possessed of many virtues.

It has been determined that colloidal preparations are solutions of ordinarily insoluble substance rendered soluble by an extreme subdivision. That is, all particles are smaller than 1/250,000 of an inch. Cobb stated that the actual minuteness of colloidal particles may be illustrated by the fact that approximately one million of them could be put into the space occupied by one red blood corpuscle or ten thousand into one gonococcus, were they hollow spheres.

It does thus seem that the silver preparations in colloidal form are in the best arrangement for deep absorption into the tissues, but since it is well known that diffusion of any colloid is a slow process, it is necessary to employ some method by which argyrol or other colloids may be kept in contact with the mucous linings of the nasal chambers for a long period of time, thus providing a means through which argyrol or other colloids may be taken by vascular supply and carried to the distant organs. The Dowling method provides a satisfactory way of applying these colloids to the various sinuses by indirect method, one which is most efficacious.

After a trial of many solutions varying in per cent, it was found that the 10 per cent solution of argyrol is the best in strength to accomplish the most successful results in treatment by the method known as the Dowling treatment.

### DESCRIPTION OF METHOD.

The tampons to be used are made from sterilized long fiber cotton wound about a long, thin wire-like applicator. This particular style of applicator and kind of cotton are essential in order that a long tampon may be properly placed by the gentle withdrawing of the applicator.

To make the tampon the necessary quantity of cotton should be flattened and stretched to the required thickness and length, then the probe should be taken in the right hand and the cotton held on the flat of the left hand. The applicator is then placed upon the middle of the cotton, which is then folded toward the body and over the wire and held in place with the thumb. The probe is then turned from left to right, or away from the body. The tampon having been wound upon the applicator, it should then be moistened to saturation by immersion in a 10 per cent solution of argyrol. The average quantity that each tampon will hold is from thirty drops to one dram. The next procedure is to introduce the cotton tampon

into the naris, above the scroll of the middle turbinated body, first giving it the *sphenoid direction*, pushing it as far back as possible between the middle turbinated body and septum. After the tampon is properly placed, the wire is slowly withdrawn by giving it a twist from right to left and at the same time giving a slight upward shove to the tampon in order to engage and hold it as high in the nose as possible. When the applicator has been sufficiently withdrawn, the handle is depressed until the wire is almost in contact with the upper lip with the tip pointing toward the infundibulum, then a final push is given in order to engage the tampon as nearly as possible in the vicinity of the infundibulum, after which the wire is finally withdrawn, leaving the tampon in its proper position. Before introducing the tampon, the nose should always be inspected in order to determine the width of the nares and the presence of any irregularities, for the tampon should be of such size as to reach from the anterior nares to the choanae posteriorly and of only such thickness as will permit a snug fit without undue discomfort.

*The tampons should always be placed in both nostrils,* for while one side may be more involved than the other, it is seldom that one side alone is affected, although symptoms may only be referred to but a single side. It is necessary to leave the tampon in place from ten minutes to an hour.

*The use of cocain before placing the tampons is seldom required and should be avoided if possible, as best results are obtained without its preliminary use.*

*It is only necessary to use a single tampon in either nostril* and in placing them there are two directions quite essential in order to locate them properly within the nasal chambers. The first direction I have termed the *sphenoid direction* and the second direction is the *infundibulum direction.* An understanding of these two directions is essential to the proper placing of the tampons. The first is the primary direction employed and the second is the final step in the operation.

The first step can usually only be approximated because the middle turbinated body is generally too large to permit the placing of a tampon direct to the ostium of the sphenoid. The second step can generally be accomplished, and I have found it the absolute sine qua non in the placing of the tampons in order to achieve full success.

The technique to be followed after withdrawing the tampon is thoroughly flushing the nares and cleansing them of all secretions. No nebulizing oil is employed and the irrigating fluid is used at the temperature of room. The use of cool irrigation after employing

tampon treatment has been found to be most satisfactory, in that the climate of Albany during the winter months the use of warm irrigation was found to be frequently followed by disagreeable after-reactions because of the relaxed state of the mucous membranes and erectile tissues. The cool solutions seem to exhibit a tonic effect upon the nasal tissues and promote the usefulness of the tampon treatment. In some cases irrigation is contraindicated, this being especially true in women at or about the time of the menses.

*Indications.* Treatment by nasal tampons saturated in argyrol (colloidal silver) solution is indicated in acute or chronic disease of the nasal accessory sinuses. Accepted as a fact, this affords a wide sphere of usefulness for the treatment as may readily be appreciated when consideration is given to the fact that acute or chronic sinus disease is a frequent complication of many diseases of the eyes, diseases of the ears, such as may involve the Eustachian tubes, middle ears or mastoid cells. All forms of deafness permit of more successful result, if, whatever method is being employed, there is at the same time additional treatment by the Dowling method directed to the nasal sinuses.

*Effects.* The results obtained through this treatment are immediate and remote, pleasant and disagreeable, and are also of subjective and objective kind. The immediate effects are suffusion of the conjunctiva, lachrymation, an increase of an already existing conjunctival congestion, sneezing and flow of mucus from the nose. Intraocular and tympanic congestions are lessened and visual acuity may be rendered more acute. Tinnitus is frequently lessened or controlled for a time.

That actual drainage of the sinuses is accomplished is well demonstrated in occasional cases of acute nature in which the maxillary sinuses are sufficiently filled with pus to overcome the light reflexes incident to transillumination, *for subsequent to treatment these sinuses will actually show a positive degree of illumination.* Of course, in chronic cases which have progressed to actual empyema, no such effect is noted, for the reason that the mucous linings are too greatly thickened to permit transmission of light rays until after many treatments, or operation has been instituted.

Another most satisfactory immediate effect is the lessening of radiating pains which may have involved the ciliary nerves or various branches of the trigeminus. Headaches which are described as frontal, vertical, occipital or of the entire cranium, are frequently promptly benefitted after one or more treatments.

*The disagreeable effects* are occasionally most positive and may be noted as a decided turgescence of the erectile tissues of the nose, increase of pains, vertigo and nystagmus. I have seen these last two symptoms of such severe nature that the patient would be unable to walk without aid, and indeed would fall if left unsupported. These aggravations are not greatly lessened by the use of cocain, but must pass off gradually, and seem to yield most satisfactorily to rest alone.

*Frequency of Treatments.* The frequency of treatments is governed entirely by the length of time the induced effects persist, and daily treatments may be necessary and again treatments should be but once a week or even less often.

*Continuance of Treatments. A single treatment is often sufficient for the cure of acute head colds, while for the more chronic conditions of the eyes or sinuses, the treatment may be necessary over a period of months or even for several years.* The length of time that these treatments may be continued is but evidence of their virtue, for many heretofore progressive diseases of the eyes are rendered sationary while the method of treatment is continued.

Diseases of the eyes or sinuses that are benefitted but not cured through this treatment will often respond to operative interference, after which further use of argyrol tampons will establish a satisfactory result.

*Value as diagnostic aid for infection and indication for operation.* The laboratory researches of Dr. Charles E. Terry, of Jacksonville, Florida (published in the Transactions of the Florida Medical Association for the year 1909) indicate the value of argyrol tampons as an aid in diagnosing hidden infections of either acute or chronic nature for in the presence of pathogenic organisms there is a distinct bleaching of the tampon which will change from its normal dark brown color to a yellowish tinge or even be fully decolorized. This fact is of importance in determining the advisability of operating upon the ethmoid region or sphenoid sinuses. In the event of progressive disease of the optic nerves or other ocular diseases, in which radiographs seem to indicate normal sinuses, though the pictures show clear, large sinuses, there may yet be sufficient residual infection to influence the progress of ocular diseases; the membranes being infected to the point of saturation, with resulting ostitis of proximate parts. This condition I have observed in a sufficient number of cases to lead me to state it as a possible cause for some otherwise inexplicable ocular diseases of progressive nature, and in lieu of "idiopathic cause", such origin should be con-

sidered in the presence of positive bleaching of the tampons. *Furthermore, a positive reaction obtained in progressive diseases should suggest the advisability of operation, providing some improvement is observed through the use of tampons employed as a therapeutic measure, and this despite the negative result of the radiographs.*

A satisfactory nomenclature has been devised whereby the argyrol tampon may be readily interpreted as a diagnostic aid, making it easy to determine progressive improvement in any given case through successive treatments. It also permits an intelligent report from one doctor to another and an interpretation by the second doctor of the first one's findings.

The following has been adopted in my own practice and is suggested for general adoption.

ARGYROL TAMPON REACTION.

Plus—1 Simple decoloration of tampon.

Plus—2 Simple decoloration of tampon, sneezing, and jelly mucus on irrigation.

Plus—3 Simple decoloration of tampon, sneezing, ocular suffusion and jelly mucus on irrigation.

Plus—4 Simple decoloration of tampon, sneezing, ocular suffusion with chemosis, jelly mucus on irrigation, and ropy discharge oftimes adherent to posterior end of tampon.

Plus—5 Simple decoloration of tampon, sneezing, ocular suffusion with chemosis, jelly mucus on irrigation, and ropy discharge oftimes adherent to posterior end of tampon, and aural reaction (vertigo).

*Illustrative Case Records.* Analysis of one hundred acute cases of head cold recently treated shows disappearance of symptoms after one or two treatments in 60 per cent of the cases. The remaining 40 per cent exhibited intranasal pathology obstructing drainage and ventilation to the sinuses, which naturally necessitated treatment over a longer period of time. Were it possible to treat all head colds by this method in their incipiency I feel warranted in stating that cure could be obtained in a very much larger percentage of cases. The only cases that would not yield quickly would be those presenting some surgical pathology.

I am glad to include reports from the records of my associates, Dr. A. C. Worth, Dr. Henry M. Grogan, and Dr. L. Prescott Brown. These cases merely represent a few for the purpose of illustration, but all are significant because of the benefits attained.

Dr. Worth states that, "in the treatment of acute rhinosinusitis by the Dowling method that the average cold will be relieved of all dis-

tressing symptoms within six days, but especially during the last three days. Tamponade does more than get rid of symptoms, it enhances the comfort of the patient during the first week very greatly over other treatments."

He submits the following cases:

1. "Mr. M., age 25 years, acute suppuration right ethmoid and frontal region (free pus at time flowing into infundibulum), very much pain. Condition entirely controlled by tamponade within ten days, when last seen return to normal appeared complete. (Operation refused.)

2. "Mr. H., age 45 years, subacute posterior ethmoiditis with pharyngitis (severe)—whole condition entirely relieved by one tamponade (no local pharyngeal treatment).

3. "Mr. H. W. B., age 45 years, chronic ethmoiditis bilateral (with associated ocular congestion of long standing). Condition greatly relieved and associated lesions cleared up by tamponade over a period of four weeks.

4. "Mrs. J. H. L., age 30 years, acute congestion, ethmoid and frontal regions left side with supraorbital pain (associated otitis media). Nasal distress relieved in three days by tamponade.

5. "Mr. A. B. McN., age 50 years, acute congestion in right antrum following removal of tooth. Symptoms and discharge cleared up after three tamponades.

6. "Mr. J. R., age 30 years, chronic ethmoiditis with acute congestion of all other sinuses. Discharge very abundant. Treatment with tamponade entirely effective within ten days.

7. "Mrs. L. F. G., age 65 years, persistent discharge following acute rhino-sinusitis. Entirely relieved by three tamponades over a period of ten days.

8. "Mrs. M. E., age 30 years, subacute pansinusitis with severe pharyngitis. Relieved by four tamponades over a period of ten days. (This case illustrates how effective tamponades are on pharyngitis in which we have to admit that ordinary applications are very ineffective.)

9. "Mrs. S., age 45 years, acute pansinusitis. Pain not severe but complaining bitterly of the odor. Relieved of odor almost entirely by one tamponade. Reported well on fourth day after treatment.

10. "Mr. C. W., age 50 years, chronic ethmoiditis left. Under treatment with ordinary methods for months. Entirely relieved by three tamponades over a period of ten days."

Dr. Grogan submitted three interesting cases of acute empyema of the frontal sinus, all presenting Ewing's sign, and all quickly relieved by the method under discussion.

Dr. Grogan submits the following cases:

1. "On Jan. 15, 1925, Miss J. A. G., age 64 years. One week ago severe cold in head, now has pain over her right frontal sinus in morning, after being up and around a while, aggravated by bending forward. Ewing's sign present. Transillumination right frontal sinus and right antrum clouded. Septum deflected high to right. Argyrol tampon with almost immediate relief of pain following pronounced sneezing. On removal of tampon much pus seen exuding over the anterior end of the right middle turbinate. Patient still under treatment, but has entire relief from pain.

2. "On Oct. 1, 1924, Mr. W. C. G., age 34 years, complained of pain over left eye following acute sinusitis. Ewing's sign present. Septum deflected high to left with a polypoid degeneration on the left middle turbinate with obstruction left nasal frontal duct. Treatment, argyrol tampon, much sneezing, and on removal of argyrol tampon escape of free pus from left infundibular region. Patient discharged Oct. 4 cured.

3. "On Mar. 15, 1923, Mr. W. H., age 37 years, history of severe acute sinusitis two weeks' duration with severe pain over left eye. Ewing's sign present. One hour ago had a hypodermic by his physician, Dr. Maguire, and now pain has stopped.

"Transillumination left frontal and left antrum clouded. Septum deflected high to left, left middle turbinate very much swollen and congested. Argyrol tamponade, much sneezing and on removal of tampon free pus seen escaping between left middle turbinate and external nasal wall. This treatment was repeated until Mar. 21, 1923, when all symptoms had disappeared and patient was discharged as cured."

Dr. Brown submits the following cases:

1. "Mr. W. B., Nov. 24, 1924, age 30 years, complained of pressure pain over right antrum and right eye following acute cold in head. Examination showed a straight septum with hypertrophied middle turbinates. Pus was flowing from under the right middle turbinate. Ewing's sign present on the right. Temperature 99,° and white blood count 10,000. Argyrol tamponades gave immediate relief and started a free flow of pus. No medicine was prescribed. The same treatment was given on the following days and the case discharged as cured.

2. "Mr. F. L. W., Oct. 2, 1924, age 22 years. Acute pansinusitis involving the left frontal and the left maxillary especially. Ewing's sign present on the left. Transillumination showed the left group of sinuses absolutely dark and the right with impaired illumination. Argyrol tamponades gave immediate relief and started a flow of pus from the left infundibular region. The pain was still so severe that he was sent to the hospital for observation and X-rays. X-rays showed large frontals which were cloudy as were also the maxillary antra. Patient treated by tampon daily for one week with complete disappearance of all symptoms (operation avoided)."

During the past twenty years I have accumulated considerable data as to the benefits to be attained in many eye diseases complicated by sinus infections and treated according to the Dowling method. That nasal tampon treatment of the sinuses is not more generally employed in the presence of associated eye diseases is unfortunate. It is especially useful in the various varieties of uveitis as is advised by Thorington on page 830, Vol. 2, of Modern Treatment, edited by Hare and Landis.

At the meeting of the Southern Medical Association at Jacksonville, Florida, in 1915, Dr. Wm. S. Manning reported many cases of iritis in which the treatment was shortened and cure of the disease hastened materially through the additional treatment with nasal tampons.

HEADACHES.

Quoting from Dr. Crawford R. Green, of Troy, N. Y., in a paper entitled "The Dowling Method of Nasal Tamponade in General Practice", which appeared in the *New England Medical Gazette*, August, 1916, he states concerning *headache* "among the most common of the condition to which the treatment is applicable is reflex headache, whether it have its origin in ocular disturbances or in disturbances of the sinus per se. In fact, the treatment is so beneficial in so many cases of chronic headache that it is worthy of trial even in cases where the cause is not positively known to arise from the sinuses or any of the organs of special sense. It is astounding in the light of our present knowledge, how little attention is paid to the condition of the accessary nasal sinuses. The catarrhal headaches of congestive type that are caused by the locking up of secretions in these cavities are extremely common, and, in the majority of cases, all the victims receive is palliative treatment with, too often, an erroneous diagnosis of the causative condition. Headache tablets, powders, nostrums may give temporary relief, leaving a dull

unclear sensorium behind it; the Dowling tamponade *cures* by removing the cause and leaves behind a clear sensorium and a sense of exhilaration and well being that is the result of the removal of constant irritation. *The exhilaration and ability to think clearly is a striking immediate effect of the treatment.* This result is well demonstrated by two patients who have been under the author's observation for several years. One is a lawyer, the other is the treasurer of an important manufacturing company. Both have been long sufferers from catarrhal sinusitis. Almost invariably, before undertaking any unusually important work, these men will appear with a request for tamponade because it makes their brain seem so clear and they can concentrate their minds so easily upon their problems.

"Relief from headache by this treatment is in many cases so immediate that a patient who comes to the office with severe headache frequently goes out with his head absolutely clear. The chief result, however, is that many patients who have suffered for years from severe and frequently recurring headaches are relieved altogether from having headache. To this end the treatment must naturally be persisted in for some time. The treatment must be given twice a week, once a week, or perhaps once in two weeks as conditions seem to indicate, and the persistency is well rewarded. The writer has cared for patients who have received this treatment regularly every week or two for three months, six months, a year. Formerly, they suffered from severe headaches which incapacitated them from work for a day or more every week, every two weeks or every month. They now pass month after month without a single headache, or, if they should have headache, they know where and how to receive prompt relief."

### POLYPOID ETHMOIDITIS.

Before operating for nasal polyps in their incipient stage when they first begin to be present beneath the scroll of the middle turbinate and in the region of the infundibulum it is well to institute a course of treatment by argyrol tampons. Most rhinologists would be surprised to observe how readily these incipient polyps are influenced and disappear from view, affording the patient a clear head free of any gross evidence of disease.

### ASTHMA.

One of the most distressing conditions from which patients suffer and which has proven most difficult for physicians to successfully combat is *asthma.* Hazeltine and LaForge offer much in evidence corroborating the author's findings that argyrol tampons play

an important part in the successful treatment of asthma. The acute paroxysm does not always yield to adrenalin or other treatment, but here again argyrol tampons will often prove a friend in need. A single case is sufficient as record.

Mrs. W. G. M., age 65 years, had suffered for some time with chronic frontal empyema and polypoid ethmoiditis. Operation was repeatedly refused. The writer was called at four o'clock in the morning and urged to hurry to the bedside of this patient because it was the belief of the nurse in charge that she was dying. I found her bolstered up in bed with all the intense agony of the asthmatic expressed by audible wheezing, gasping and reaching for breath. Adrenalin and other remedies had been employed, but without effect. I assured the patient that she would soon be all right. I made use of my method of treatment and within a half-hour the patient was recumbent on one pillow and breathing easily. She has never suffered such an attack since, the condition being kept under control by nasal tampons alone.

Concerning bronchial asthma Hazeltine has reported cases typically rhinological in which he states no surgery was instituted and the satisfactory results obtained were due to the use of nasal tampons according to the method under discussion. In an article entitled "Bronchial Asthma", by Hazeltine, which appeared in *Clinical Medicine* for August, 1924, two cases are of especial interest in the present discussion, for after failure of other treatments these asthmatics were cured through resort to the Dowling method.

One case reported by Dr. Paul Hohly, of Toledo, Ohio, is commented upon by Hazeltine as follows: "A typical 'sensitization' case reported by the patient's father, himself a physician of wide experience in the treatment of asthma. The resources of experts in 'immunization methods' were exhausted without avail. The case was easily recognized as chiefly rhinological and required only such treatment as a physician untrained in the specialty could give after a few days' instruction. Note the prompt removal of all food restrictions and the early disappearance of 'sensitization'. B. H."

A second case of rhinological type was studied and diagnosis confirmed by many physicians. Excerpting Hazeltine's report the points of present interest are "the only abnormal finding in this child was a chronic, purulent, posterior, ethmoid infection (bilateral). The only measures employed were treatment (daily at first, then with lessening frequency) of this infection by the Dowling method. Relief was apparent in two weeks, and in one month, she was sleeping normally without use of adrenalin or other palliative.

At the end of four months the child had gained fourteen pounds in weight and was entirely free from bronchospasm."

I saw this patient while on a recent visit to Chicago. She appeared perfectly well and had come out during a violent storm of snow and sleet. I asked the patient if she was not afraid to expose herself at such a time and she replied "Oh no, for I never have asthma any more". This patient has been well for five years.

## CONCLUSIONS.

1. Silver colloids are of distinct value in the local treatment of both acute and chronic sinus diseases.

2. The best method of employing colloid silver preparations in the treatment of sinus disease is by means of nasal tampons according to the Dowling method.

3. Clinical experiments and observations during a period of over twenty years accords argyrol first place because of its positive remedial value in treatment and, secondly, because of its unique and positive value in determining the presence of pathogenic infections within the nasal chambers and accessory sinuses in spite of negative radiograms or other negative findings.

4. Positive Dowling reaction in the presence of symptoms unrelieved by treatment is sufficient evidence to warrant operation even though X-ray findings are negative.

5. Argyrol tampons are a valuable aid in treatment and through their use a near approach to sterility may be attained preparatory to many intranasal or sinus operations.

6. As a postoperative procedure much intranasal or sinus surgery of doubtful issue may be rendered successful.

7. Acute rhinosinusitis uncomplicated by chronic pathology are readily cured in from one to several treatments conducted over a period of from one to four or five days.

8. Chronic pathology obstructing the nasal meati and blocking the drainage and ventilation of the sinuses is so influenced by nasal tampon treatment that normal drainage and ventilation of the sinuses is obtained, thereby avoiding operation in many cases; or where surgery is a sine qua non making it possible to attain success by less radical procedures than may at first have seemed necessary. In addition an interval operation is made possible in cases of recurrent

sinus attacks making more likely successful issue in cases of this trying character.

9. *Headache.* The daily early morning headache, the vacuum headache and the "Sluder syndrome", all, so diagnostic of sinus disease are readily overcome providing the pathology is not typically of surgical nature.

10. Both the Eustachian tubes and lachrymal canals are so readily benefitted that dilation of these canals is rendered less difficult and the beneficial results more permanent.

11. *Eyes.* Many inflammatory diseases of the eyes exhibit a quicker response to treatment if the usual recognized treatment is complimented by nasal treatment of the sinuses.

12. *Asthma.* Acute asthmatic attacks may ofttimes be controlled for the time by the Dowling method of nasal tampon without the aid of other measures. The Hazeltine-LaForge treatment, than which no more successful treatment has yet been devised, for chronic bronchial asthma, includes the proper use of nasal tampons saturated in 10 per cent argyrol solution.

13. Aggravations of varied kind and great severity are possible from the use of argyrol tampons but such effect does not contraindicate their use. These unfortunate effects excited by the treatment are most apt to occur in women immediately before, during, or soon after the occurrence of the menses.

116 Washington Avenue.

# THROAT STIFFNESS AND THE VOICE.

Dr. John A. Glassburg, New York.

Throat stiffness is the most common ailment that attacks the throats of professional voice-users. Though not a recognized entity, it is so prevalent and characteristic that it deserves a special category and description. This affliction, which is the basis of most if not all of the laryngeal difficulties of singers, is not really a disease per se but a symptom complex. Throat stiffness is the strain of the laryngeal muscles produced by an incorrect method of voice production. The occasional huskiness, the intermittent hoarseness, the easy fatigue, the inability to sustain long passages and the defective middle or high register are usually due to this condition.

Ordinarily, the frequent use of the voice should not tire but strengthen the laryngeal muscles. A voice used correctly can be exercised daily without strain or fatigue. In fact, the exercise of a properly placed voice, well produced, increases the volume, facility and power. Repeated attempts to increase the register and produce loud or forceful sounds, strains, stiffens and eventually weakens or destroys the voice. Bad teaching and poor voice production have spoiled many a good voice. A bad voice may not be bettered but a good voice may be ruined.

When the voice is used correctly each laryngeal muscle contracts in a normal, physiological fashion, but as soon as an extra strain is put upon the voice or the notes are taken in a false manner, an undue degree of effort is exerted by the muscles involved and stiffness results. Throat stiffness is really an occupational disease peculiar to voice users.

To obtain a clear understanding of the causation of throat stiffness it is necessary to appreciate the physiology of voice production. There are nine muscles in the larynx, the right and left thyroarytenoids, the right and left cricothyroids, the right and left lateral cricoarytenoids, the right and left posterior arytenoids, and the arytenoids. Tone is produced by the contractions of these muscles and the vibrations of the vocal cords.

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The posterior cricoarytenoids and the lateral cricoarytenoids have antagonistic actions, the former opening the glottis and the latter closing it and putting the vocal cords on tension. If, because of improper training, too much effort is exerted in producing the sounds the posterior cricoarytenoids are unduly contracted and the opposite acting muscles, the lateral cricoarytenoids have to overact in order to overcome this contraction. The overaction fatigues the delicate muscles and stiffness follows.

The recognition of throat stiffness, once it is firmly established, is a simple matter, for the symptoms are those of a laryngitis. The difficulty of diagnosis is in the incipiency or early stage. The first symptom at the very beginning is an inability to sing or practice for the customary period of time without fatigue. There may also be transitory huskiness. Then there is a loss in the range, a diminution in the sustenance of a note and an impairment of the pianissimo. Eventually, hoarseness sets in and the voice may be irretrievably lost. A common association is the production of either too much or too little secretion with resultant excessive phelgm or dryness.

The prognosis depends upon the time of recognition of the ailment. The earlier this is done the better the chances for recovery. The best method of determining the presence of throat stiffness is the detection of any change in the quality of the voice. An experienced singer may be able to detect her own mistakes but the ordinary voice user is usually an incompetent judge, for as a rule she cannot hear her voice as well as a discriminating listener with a trained ear.

The treatment of throat stiffness is based on physiological principles. The cause is improper use of the voice and it follows that the rational treatment should embody a protracted rest to heal up the injury and then a regime of proper methods of respiration and voice placement. Local irritants, such as tobacco, strong liquors, spices and acrid foods should be avoided. The inhalation of steaming vapors medicated with the compound tincture of benzoin is at times very soothing.

Occasionally a nodule or node is found. This is a small growth along the sharp border of the vocal cords and well exemplifies the evil effects of improper usage of the voice. In the vocal cords there are minute glands that give off a mucous secretion which acts as a lubricant. When the voice is forced, the cords are tightly squeezed together and the ducts from the mucous glands are pressed upon. When the pressure is sufficiently great, the walls of the ducts approximate and the secretion formed in the glands cannot escape. The secretion then accumulates and a tiny protuberance appears on the

cord. This is known as a soft nodule. If the accumulation of mucus persists for a long time, it finally hardens, becomes fibrous and the singer's hard node is formed.

When nodes or nodules are present the local application of astringent remedies is indicated. In extreme cases surgical removal may be necessary. The usual astringent employed is silver nitrate. Though silver is probably the most effective remedy, its use because of its irritating action is fraught with great dangers. It is of utmost importance that great prudence be exerted in the choice of the form of silver employed. Collene, a colloidal silver preparation, may be applied without fear for it has the potency of the mineral solution without any of its irritating properties.

Indirectly, nasal obstructions, infections of the accessory sinuses and catarrh of the nose predispose to throat stiffness. The discharge from the nose drips into the throat and sets up a sympathetic inflammation which hinders the normal contractions of the laryngeal muscles. Tonsils filled with cheesy deposits act in a similar manner. The treatment in these cases is removal of the offending structures and a clearing up of the sinusitis.

In operating upon voice users conservatism should be the rule. Usually when a singer or speaker presents himself he has already been the subject of too much and often injudicious treatment. In removing nasal obstructions caution should be taken not to remove too much, for this may lead to an atrophic catarrhal condition of the nasopharynx. Tonsillectomy is still a mooted question. Every case is a law unto itself and should be judged on its own merits.

Not infrequently, when throat stiffness is present, there is found an associated inflammation of the pharyngeal mucous membrane. This pharyngitis can be allayed by sprays and gargles. The usual preparations employed are of an alkalin antiseptic nature. Recently a colloidal silver solution has been developed which makes a very efficient gargle. If in addition, there is a catarrhal condition of the lining of the nose, douching with a hot alkalin solution is beneficial. A very efficient and inexpensive preparation is the following combination: 20 drops of carbolic acid to 1½ ounces each of sodium biborate and sodium chlorid. A half a teaspoonful of this powder should be used to every glass of hot water and the nose should be douched three times a day with a small soft rubber ear and ulcer syringe. The head should be bent forward and downward over the chest to prevent the fluid from flowing into the Eustachian tube and the middle ears.

Finally it should not be overlooked that after all the throat is only a part of the body and what affects the whole affects the part. Any constitutional ailment which debilitates the individual will impair the normal functioning of the vocal mechanism. Anemia, undernourishment, dissipation and constipation are the more common general causes of throat stiffness. When any of these conditions are present they are to be overcome by hygienic and therapeutic measures before speaking or singing is undertaken as a career.

However, all these medical measures are only symptomatic remedies and do not strike at the root of the trouble. They alleviate, but do not cure. Douching, spraying and gargling, no matter how well done and how conscientiously carried out, will not overcome the throat stiffness if the voice is improperly used. The real cure is a long rest followed up by a change in the vocal habits and the institution of a correct system of voice production.

As soon as all the visible pathological conditions in the nose and throat have been removed and the vocal cords have regained their normal appearance and sharp knife-like edges a carefully selected course of studies may be allowed. In the beginning the voice should be exercised at a lower pitch than the usual, the high register should not be attempted and proper breathing must be learned. Gradually the period and range of exercise may be increased until normalcy is regained. During this reconstruction or retraining period the throat should be examined at regular intervals to guard against the possible return of the causative factors. The cure of throat stiffness is a long and tedious affair and it requires faithful adherence on the part of the patient and great patience and judgment on the part of the laryngologist.

103 East 10th Street.

## A NEW DEVICE FOR EAR MASSAGE.*

DR. HAROLD HAYS, New York City.

Some form of mechanical massage apparatus seems to be most necessary as an adjunct to treatment of middle ear deafness. The majority of patients enjoy this form of treatment and many of them think they are benefitted by its use. There is no question that many patients think that they hear better after a vibration to the drums, even when it is impossible to ascertain this improvement by the tests for hearing acuity. During the past few years, various types of instruments have been devised for the purpose of massaging the membrana tympani and to increase the circulation in the middle ear. The writer has tried many of these instruments but has found two decided objections to them. In the first place, none of them is mechanically perfect and, secondly, he was never satisfied that they exerted any marked beneficial influence upon the drum or middle ear either when used as an external massage or when the vibrations were sent through a Eustachian catheter.

The comprex oscillator designed for the author in March, 1924,* has now been perfected. It was designed with the view of overcoming the inadequacies of machines now in use for this purpose. Although primarily intended to produce a thorough and effective ear massage, this device has proven itself applicable to a great many purposes and a valuable aid to the physician.

The apparatus consists of a small universal electric motor having directly connected to it a one-cylinder, air-cooled pump. This assembly is suspended from a bracket as shown in the illustration. The base contains a rheostat which controls the motor speed by means of a small indicated dial. The vibrations are created by the rapid strokes of the piston which forces the air through an opening in the top of the cylinder. To this opening may be attached a suitable device for carrying the vibrations to the ears. The novel features of this apparatus are its speed range, from nothing up to 8000 revolutions per minute, and its light weight, which is 5½ pounds.

The amount of air current must be accurately measured for each case. This is best done by placing the ear connections lightly in one's own ears. A notation may be made for each case by the mark on

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*Presented before the Oto-Rhinological Section of the A. M. A., June, 1924.

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the rheostat and also on a special indicator, which is placed on the air outlet but which is not shown in the illustration.

The writer has used this type of instrument for over a year and is satisfied that it is very serviceable. He does not feel that it will replace any other form of treatment nor that it, in itself, will improve hearing, but it does exercise an influence on the drum and possibly causes circulatory changes. That a change in the circulation in the drum takes place can be readily demonstrated with this new instru-

The above device is made by the Comprex Oscillator Corporation, 775 East 143rd street, New York City.

ment: for examination with the electric auroscope will frequently show that the drum has changed from dull gray to a faint pink.

For the ordinary forms of massage a suitable applicator is attached to the rubber tubing which transmits the vibrations. This massage is characterized by its vigor and remarkable penetration.

Both suction and compression can also be obtained, the suction for all forms of evacuation and the compression for spraying and similar uses.

22 West 74th Street.

# A SIMPLE DACRYOCYSTORHINOSTOMY FOR THE CURE OF DACRYOCYSTITIS.*

DR. FRANK M. HANGER, Staunton, Va.

It is now an accepted fact, that dacryocystitis is the result of a strictured condition of the nasal duct, and generally produced by the extension of an inflammation from one of the nasal sinuses; the maxillary antrum, the ethmoidal cells, or frontal sinus, named in the order of causative frequency.

In order to effect a cure, normal drainage from the lachrymal sac into the nose must be re-established.

If the sinusitis, which caused the condition, be active, it must be eliminated first, or, treated *pari passu* with any operative procedure on the nasal duct.

However, it is generally found that the sinusitis has disappeared, *vis medicatrix naturae*, and we are only called upon to overcome the obstruction in the nasal duct.

This has long been attempted by the oculists, and is so advised in all books on ophthalmology. Slitting the lower canaliculus and passing probes of increasing size, to overcome the strictured condition of the nasal duct, is the recognized procedure. Some early cases are thus cured, but, in cases of long standing, the results are so discouraging that very many of the leading ophthalmologists have now acquired the routine habit of extirpating the lachrymal sac, which cures the filthy pus discharge into the eye, but leaves the patient to weep, alone, for the rest of his life. In this advanced age of surgery, there is no operation which should meet with more drastic condemnation than this. For, it leaves a scar, is a mutilation, and a surrender to a condition, which, in the author's judgment, can be easily cured.

However, the ophthalmologist is not altogether to blame. The time was, when he referred these cases to the rhinologist; but, owing to the difficult technic of most of the intranasal operations commonly employed, and because of the use of a faulty surgical principle on which they are based, *i. e.*, a fenestrated opening—the nose-man has gotten little better results, in the cure of dacryocystitis, than the eye-man. Consequently, the ophthalmologist harked

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*Read before the Virginia Society of Oto-Laryngology and Ophthalmology at Lynchburg, Va., Oct. 21, 1921.

back to the selfish position of regarding everything as fish which came to his net, and went on, and is still going on, with the mutilating operation of extirpating the sac. And, as a natural consequence, these unfortunate patients have suffered;—torn, as it were, between hawk and buzzard. In January, 1915, the author published an article in THE LARYNGOSCOPE, entitled, "An Intranasal Operation with a Guide for the Cure of Dacryocystitis". Since which date, until two years ago, the operation has been performed as then described, with the most gratifying results. But, in as much as the technic has been modified to some extent, and some unnecessary instruments dispensed with,—thereby making the operation more simple and easier to perform,—it is deemed necessary to give somewhat of a recapitulation of the aforesaid article, in order that a better understanding may be had, and in order to induce some members of the profession to undertake the operation, because of its increased simplicity.

No discussion will be entered into, as to the merits or demerits of the numerous intranasal operations which have been devised for the cure of dacryo-cystitis. The easiest of them will be found difficult, and, as a rule, unsatisfactory in results.

They sound easy on paper, but are hard to put into execution by the average operator. The chief cause of their failure is, that the fenestrated opening, which is called for in nearly all of them, is made through bone and its coverings into the lachrymal sac and nasal duct.

Such an opening is apt to close and the old cystitis recurs,—it being a violation of a cardinal surgical principle, as before mentioned. The best of these operations can be found in Loeb's Operative Surgery on the Nose, Throat, and Ear,—a most complete and valuable work. The principle which underlies the author's operation is the conversion of the nasal duct into a gutter, and was first devised by him in 1913.

However, before advising the operation herein set forth, the author presupposes that failure has resulted from a fair use of lachrymal probes, accompanied by proper irrigation and medication. It is best to have an assistant in this operation. The only instruments necessary are Myle's nasal speculum, Struycken's nasal forceps, a large lachrymal probe,—Theobald's No. 13,—a probe-pointed canula, the same size and curve as the No. 13 probe, Schmeden's triangular-shaped punch forceps, medium size, of Huber's set, and the author's special right-angled *straight* punch forceps, with which

the gutter is made. However, the right and left *curved blades* have a distinct advantage,—all made to fit in a universal handle. One-half hour before the operation, ¼ gr. sulphate of morphia should be given hypodermically. The operation is by preference an office one, and is done with local anesthesia,—the patient being seated in a chair with a head-rest. Yet, it can be done under general anesthesia, with patient in a semirecumbent position. First, a few drops of equal parts of a 20 per cent solution of cocain muriate and adrenalin chlorid, 1 to 1000, are injected into the lachrymal sac. Then, a small probe, so moistened that pulverized cocain will adhere to

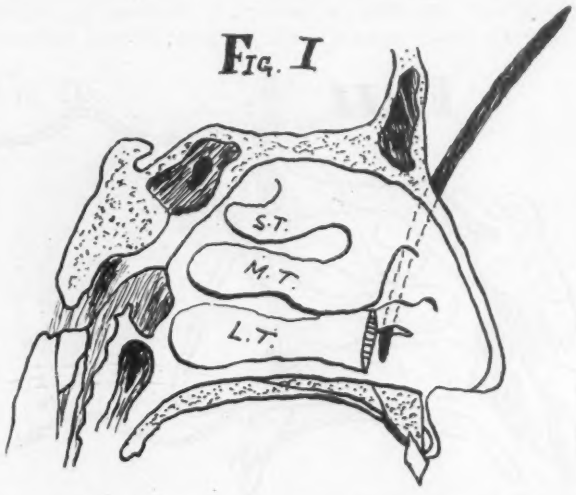



Fig. 1 shows the front end of the lower turbinated bone cut away and the large probe No. 13 in the nasal duct: the end can be seen in the lower meatus.

it, is passed into the sac and the cocain slowly worked down in the nasal duct, as far as the stricture. In a few minutes, the whole canal will be so anesthetized that larger and larger probes can be passed into the nose until Theobald's No. 13 can be passed without pain.

This probe is left *in situ*, while the inferior turbinated bone and the site over the nasal duct is rapidly cocainized and adrenalinized with a cotton swab,—special care being given to the under-surface of the inferior turbinated. Finally, inject the front one-third of

this bone and the site over the nasal duct and lachrymal sac with a 1 per cent solution of novocain with adrenalin. And, as an extra precaution, inject a few drops of this solution along the ascending process of the superior maxillary bone as high as the lachrymal sac by introducing the needle beneath the upper lip.

This should be done, even when a general anesthetic is to be used, in order to diminish hemorrhage. The front attachment of the inferior turbinated is now severed with Struycken's forceps, back a little beyond the lachrymal probe, and enough of the bone cut away with the triangular punch forceps to fully expose the lower end of the probe in the inferior meatus (Fig. 1).

The operation can now be finished by drawing the lachrymal probe or guide slowly upward, while the front or male blade of the

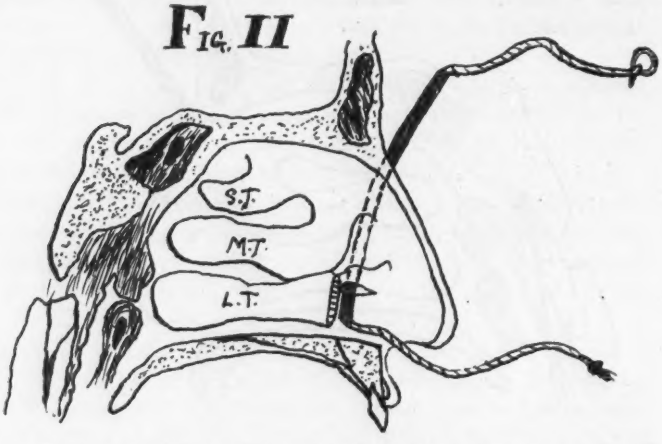



Fig. 2 shows the probe-pointed canula in the nasal duct bearing the silk thread, one end of which has been brought out of the nose to be knotted in the male blade of the special punch-forceps.

special punch-forceps follows in its wake and bites away, at several bites, the front inner wall of the nasal duct up beyond the stricture *into the sac;* thus, converting it into a gutter. While doing this, the male blade must be directed upward, forward, and inward, by depressing the handle of the forceps downward, backward, and outward.

In the nature of the case, the front inner wall of the duct is cut away, leaving the posterior edge of the gutter with a muco-osseous flap which extends forward, and, if left, will eventually become adherent to the front edge and block up the gutter. This flap must

always be cut away, with the triangular-shaped punch forceps. The male or movable blade must be kept in the gutter when this is being done; otherwise, the flap cannot be cut away.

In this manner, the author has performed the operation for five years; but, having found it, at times, more or less difficult to orient the male blade and cause it to follow the probe, because of too much blood or misbehavior on the part of the patient, the technic, at this point, has been changed, by withdrawing the large probe entirely and passing the probe-pointed canula, carrying a strong No. 3 silk thread twelve inches long, knotted on the probe end,—the knot being partly embedded in a counter-sunk cavity, and too large to be

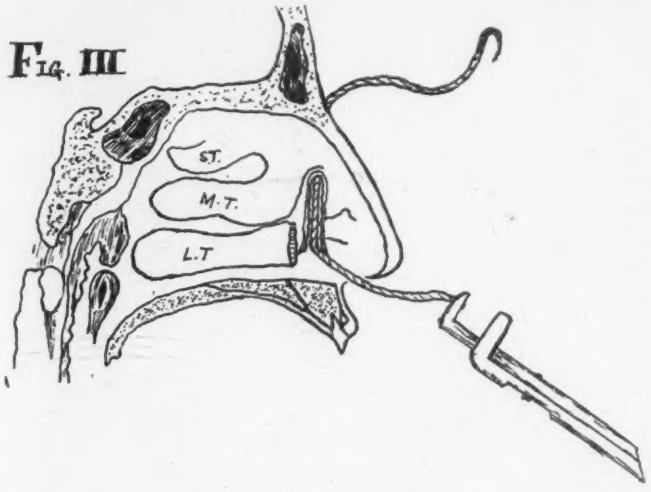



Fig. 3 shows the operation completed: the gutter cut and the special punch-forceps removed from the nose, and the probe-pointed canula from the nasal duct.

drawn into the canula—2 or 3 m.m. of thread are left extending beyond the knot. The end of the thread is caught and drawn from the nose and the knot cut off (Fig. 2).

The end of the thread is now passed through the hole found in the top of the male blade of the forceps, from back to front, and knotted on the front face of the blade, so it cannot be withdrawn from the blade,—the hole being counter-sunk on front face of the blade to receive the knot. Now, by pulling on the thread, above at the eye, the point of the male blade is brought tight against the

probe end of the canula and the thread fastened in the two notches found at the top, to keep the point of the blade in this position. Then, your assistant draws the canula slowly upward, the male blade is caused to follow and the gutter made with the greatest ease.

At the same time, the operator directs the male blade upward, forward, and inward. In fact, this change in the operation makes it fool-proof, and the most inexperienced operator can perform it.

The operator can tell when the gutter has been cut high enough, own weight, as the inner wall of the duct has been cut away and by the ease with which the probe can be reintroduced into the nose, and, besides, it will fall towards the outer canthus of the eye of its gives it no support.

It is best to pack the nose with a strip of gauze, for twenty-four hours, to prevent the possibility of hemorrhage.

A large No. 12 or 13 lachrymal probe should be passed and the sac irrigated daily, until natural drainage of tears is established; this should be the case, in a week's time, if not sooner.

However, as an extra precaution to insure proper healing and to keep down excessive granulations, the edge of the gutter should be mopped with a 40 gr. solution of silver nitrate, every two or three days, for several weeks. This should be done while the probe is in place, and the superfluous solution washed off before it is withdrawn; and, as it is withdrawn, the point of the probe should be carried inward toward the septum of the nose and caused to sweep up the length of the gutter in order to break up any adhesions of its edges.

Notwithstanding this precaution, the gutter never remains as high as it was cut, but heals down from its apex, several millimeters, forming a web-like valve which *may* require removal, because of being tight enough to obstruct the passage of tears from the sac. However, this is rarely the case, and a second removal of the valve is never necessary.

The objections to the operation are two: First, the sacrifice of the front part of the inferior turbinated bone. As for this, the author has never seen a nose which became dry, or seemed to appreciate, in the least, this loss of bone. Second, the passage of air from the nose to the eye, when the nose is blown forcibly, with the possible carrying of infectious material to the conjunctival sac.

This passage of air only remains permanent in a few cases,—the web-like valve preventing it; and, when it does exist, is regarded as a mere bagatelle by the patient. It has never caused conjunctival

infection, in the author's experience. Besides, it can be artfully prevented, by holding the tip of a finger on the inner canthus of the eye, whenever the nose is blown, or better still, by blowing the nose gently, and not like a fog horn.

The simplicity of this operation, the ease with which it can be performed, and the absolute certainty of cure are bound to appeal to many of the profession, even to the lachrymal sac extirpator.

In conclusion, the author only asks that the ophthalmologists will give their dacryocystitis patients, which they have pronounced incurable, at least, the chance of being cured by this operation, before subjecting themselves to the humiliation of extirpating the lachrymal sac and consigning these unfortunates to the hopeless condition of an annoying epiphora. Yet, they claim that the lachrymal gland secretes fewer tears, after this operation, and the epiphora is not bothersome. The author believes in cell intelligence. The reparative power of diseased and wounded tissue can only be thus explained. But, when an operator claims for the lachrymal gland that human astuteness of ceasing to function, because he wishes it to be the case, after he has extirpated the sac, is merely hiding behind a smoke screen and administering soothing syrup to a guilty conscience for a piece of unpardonable surgery. It matters not where the breach in the continuity of the drainage system takes place, whether in the canaliculus, sac, or nasal duct, the tears are secreted just the same, and their overflow a constant quantity, under a given irritation.

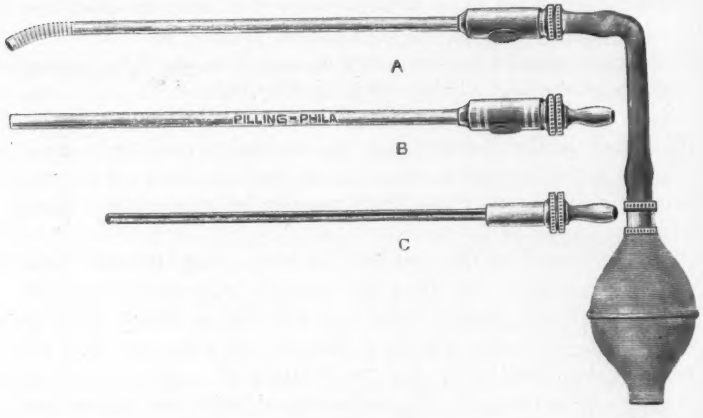
A reliable cure for dacryocystitis has been a long-felt need in the medical profession, and from the author's experience with this operation,—having failed to cure only one case in sixteen since its origination,—he cannot help but believe the day will come when the torturing lachrymal probe and the wearing of useless styles and canulae will be relegated to a much deserved limbo, and be regarded as curios of an ignorant past, and the lachrymal sac extirpator will repent, and finally become as extinct as the dodo and the mastodon.

## A NEW BRONCHOSCOPIC POWDER INSUFFLATOR.*

DR. LOUIS H. CLERF, Philadelphia.

Pneumonography or lung mapping has a wide field of usefulness in diagnosis and localization of diseases of the lungs. It depends primarily on the insufflation of a dry, finely divided, radiopaque substance into a part of the bronchial tree.

The insufflator shown below (Fig. 1) consists of a long hollow tube which is fitted with a gutter-shaped carrier. This can be removed from the outer cylindrical tube. The gutter is fitted with a cone-shaped end which fits accurately into the sleeve of the outer




tube. To its proximal end is attached a common hand bulb. To fill, the gutter is removed from the outer cylinder and powder is loosely scattered throughout its entire length. It is then returned into the cylinder. The looseness of the powder decreases the tendency to clog when blown out. Should it clog the gutter-tube can be rotated within the outer cylinder.

These insufflators are also made with vertebrated ends to permit insufflation into the upper lobe bronchi or "around the corner".

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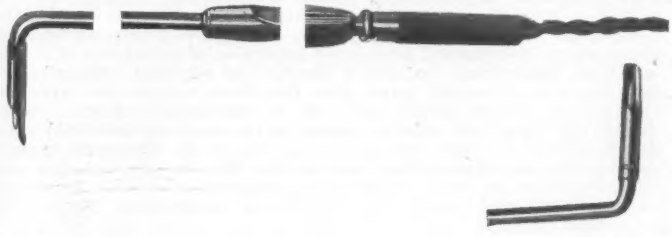
*Read before the Philadelphia Laryngological Society, Oct. 16, 1924.

## A COMBINED ILLUMINATOR AND RETRACTOR FOR RADICAL SINUS OPERATIONS.

DR. WILLIAM SPIELBERG, New York City.

With the ordinary means of illumination employed at the present time, and the profuse amount of bleeding in the radical maxillary and frontal sinus operations, it is rather difficult to obtain a good view of the interior of the sinus cavity; the operator is frequently satisfied to remove as much of the diseased tissue as he possibly can see or find by a systematic curettement of all surfaces, leaving the rest to take care of itself.

In order to assure a good and thorough illumination of the interior of the sinus and so make the complete removal of all diseased membrane possible, I have devised an illuminator which can be carried into the sinus cavity and used both for illumination and retraction.



The illuminator can be placed in any desired position. It lights up the sinus so perfectly as to make every particle of membrane visible to the eye of the operator and assistant.

Before the instrument can be used to advantage, all bleeding must be stopped. The cavity or sinus is therefore packed with gauze saturated with adrenalin 1/1000 and left in for 2 to 3 minutes. The packing is then slowly removed, the illuminator introduced and the antrum curetted under direct illumination.

Especially is this instrument valuable in the terminal stage of the operation, when most of the diseased membrane has been removed, bleeding controlled, but small areas of uncuretted membrane or polypi still remain and can be seen by this method of illumination only.

I wish to express my indebtedness to the Pfau Surgical Instrument Company for the construction of the instrument.

211 Henry Street.

# THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OTOLOGY.

*Regular Meeting, December 12, 1924.*

**Symposium on Minutiae of Surgical Technique. a. Jugular Ligation.**
Dr. Isidore Friesner.

One of the most important steps in jugular ligation is the first one, the arrangement of the patient's position to facilitate access to the deep tissues of the neck. The patient should lie with the shoulders flat across the table; the shoulder of the operative side should be raised by means of a folded sheet and a sandbag placed under the neck so that the head falls somewhat downward; the head is supported in this position by a second folded sheet, which is less thick than either the sheet under the shoulder or the sandbag under the neck.

Then, of course, the proper incision dissection. In exposing and ligating the jugular vein, I have been accustomed to make an incision beginning above on a line from the tip of the mastoid and extending downward to the middle of the suprasternal notch. I begin the incision above at about 3⅓ inches above the suprasternal notch, extending downward 2½ inches. Then, if you do the dissection carefully and slowly you can see the various structures through which the dissection is made—the skin, the superficial fascia, the platysma. As a rule, the incision is made too far back, so that after the platysma is incised one is compelled to dissect it forward in order to find the anterior border of the sternocleidomastoid muscle. I have now dissected the skin and superficial fascia away, so, and I exposed the platysma, separating it from the skin. You will notice that the fibres run in this direction. This is the anterior border, here, of the sternocleido muscle. Now, after having found the anterior border of the sternocleidomastoid muscle, an incision is made immediately in front of it. One must remember that the sternocleido thins out a great deal in this situation and that furthermore in front of the sternocleidomastoid is very frequently found a fairly good sized vein—the anterior jugular—and this should be avoided.

After having made the incision in the deep cervical fascia immediately in front of the sternocleido muscle, the muscle is picked up and by blunt dissection is pushed back, exposing the omohyoid. Above the omohyoid is the deep cervical fascia, and internal to that the carotid sheath. When the deep cervical fascia is thoroughly exposed, we take two pairs of anatomical forceps, and by gently tearing across it expose the vein. A grooved director is first introduced upward along the course of the vein, the fascia sheath slit, and then grooved director is introduced downward along the course of the vein and the deep fascia sheath slit. The deep cervical fascia and the carotid sheath are clamped by artery clamps and an assistant pulls on these clamps so that the fascia and vein are brought fairly superficially into the wound. When the vein is in this situation, it is grasped by the anatomical forceps and separated from the carotid sheath until it is completely free; then by means of the anatomical forceps or an aneurysm needle, a loop of chromic catgut is carried around the vein. This loop is tied, first above as far upward as I can get and the vein is stripped out by the other loop—the lower loop—which is then tied, the two ligatures being separated by each other by an inch. Between these two ligatures the vein is cut. The ends of the lower ligatures are cut away; the upper ligature is left *in situ*, and a piece of sterile adhesive holds it to the skin.

The purpose of that is that should it be necessary to excise the vein

the chromic gut leads to the upper end. We have found excision necessary in a very small proportion of these cases, perhaps not over 2 per cent, after ligation.

The wound, that is the skin and fascia after the vein is ligated and cut, are sutured, leaving a drain in the space caused by the obliteration of the vein. Sometimes after the removal of the drain of folded rubber tissue the wound heals by primary intention; occasionally it becomes infected.

Now the specimen is dissected further here to show the relationship of the arteries and the nerves. A few days ago a general surgeon made the suggestion that inasmuch as the glands of the neck and goiter operations are removed through a horizontal incision with good cosmetic results that it might be well to do jugular ligations in the same way. The disadvantage of the vertical scar is that some months later it has a tendency to spread out, and that whereas at first you see only a ridge, at the end of six months or a year after you are apt to see a very broad scar.

On the other side of this head, I tried this dissection. The incision here is rather more horizontal than one would like, but it shows the degree of exposure that one can get in this way. Here is the skin, superficial fascio, and platysma dissected up; the border of the anterior sternocleidomastoid, and the omohyoid. Here is the vein. I believe that through this exposure one could as readily resect as through the vertcal incision; and surely, judging from the results the general surgeons get in goiter operations this incision might be better in jugular resections. I have not yet tried it, but I am sure that it is feasible and I am confident that the cosmetic results would be better.

**Jugular Resection.** Dr. Arthur B. Duel.

The task set for the readers of the papers tonight has been simplified by presupposing that a diagnosis of septic sinus thrombosis has been made, and that they are to discuss methods of dealing with the problem.

This situation may be confronted in a very straightforward and accurate manner.

Give a case of septic lateral sinus thrombosis: what surgical measures should be employed? To my mind, the answer is:

*First:* Isolate the area of infection: convert an infection, which is lying in one of the large channels of the blood stream, producing a septicemia, and threatening a general pyemia, into a localized abscess. Do this as early and effectually as possible.

*Second:* Having cut off the focus of infection from the general circulation, deal with it as you would with any other localized abscess. Evacuate it as thoroughly as is consistent with the safety of surrounding structures.

Always keep in mind the fact that, if adequate drainage has afforded, the septic focus will take care of itself. The imminent danger to life is passed once the focus has been isolated from the main current of the blood stream. Strategically speaking, when these positions have been secured, the battle is won.

*But*—always provided:

*First*, that the area of infection has been isolated from the general circulation *in time* to prevent the dissemination of foci to kidneys, splee, liver, lungs or elsewhere: and—

*Second*, that the isolation has been accomplished with such judgment and skill that the patient has not been exhausted by the effort.

The time element is of such great importance that one may fairly say a perfection of technique, which in the early stages would almost certainly cure the patient, might, in the later stages, offer only a small chance of success.

It was from this very important consideration that I was led to say at the outset, given a diagnosis of septic sinus thrombosis, isolate the infection as early and as effectually as possible.

As to the advisability of early operation in the interests of the patient there will hardly be any adverse discussion.

The question as to the advisability of the second postulate, *viz:* that the isolation be made as effectually as possible, might well bring out a diversity of opinion, in a large class of cases where the infected thrombus is a parietal one, only partially occluding the lumen of the sinus; or even in another class where a completely occluding thrombus occupies a limited area in the sigmoid portion of the sinus or the jugular bulb. In either of these types it is possible to evacuate the thrombus, either wholly or partially, by opening and curetting the sinus.

In my opinion this is a most undesirable procedure for many reasons.

*First:* It is accompanied by a terrific hemorrhage; a depletion which a patient can ill afford.

*Second:* It is done hastily, inexactly, and is more than likely to leave a portion of the clot.

*Third:* Even if it were completely removed, the infected sinus wall is left to act as a focus for another thrombus.

*Fourth:* Granting complete removal, the method may easily dislodge pieces of infected thrombus, which, carried to distant parts, may create havoc.

Taking into account the depletion from the loss of blood and the uncertainty of success, the saving of time does not offer a sufficient compensation for its employment.

In a word, the presence of septic thrombus in the lateral sinus is too great a menace to life to warrant the use of any but the most effective measures of combating it.

Whether or not you all agree to this very positive conclusion, the statement of it places me logically in a position to present the few points in technique which I have been invited to submit.

As you all know the venous current sweeping around on either side from the torcula Herophili passes through a long stretch of the lateral sinus before any other branches empty into it.

Near the knee of the sinus, the superior petrosal and the mastoid emissary veins empty into it. Again, at the bulb, the inferior petrosal empties into it. From the bulb on in the jugular there is another long stretch before the facial joins it. Still further below, the thyroid vein.

Thrombosis of the lateral sinus, resulting from an extension of infection from the mastoid, starts in the wall of the vessel somewhere from the knee to the jugular bulb. This thrombus may build up until it has extended to the torcula in the distal end; or through the length of the jugular to the innominate vein, in the proximal end. In recent years, since the early recognition of sinus thrombosis has been made possible in a large majority of cases, one seldom encounters these extensive clots, which were not so uncommon two or three decades ago.

The majority of cases now operated have usually a parietal clot, occasionally an obstructing clot, in the sigmoid flexure or in the jugular bulb.

Anatomically, the venous channel, as I have briefly described it, offers an ideal arrangement for carrying out the plan of isolating the thrombus from the main venous current. At the torcular end the sinus can be readily constricted far beyond the clot and far beyond the confines of the inflammation of the sinus wall. In a similar manner the jugular may be constricted in the neck.

There are three steps in the operation, *viz: First*, the treatment of the jugular in the neck; *second*, the treatment of the sinus in the posterior cranial fossa; *third*, the evacuation of the clot.

I have indicated the steps of the operation in the order in which I believe they should be done.

I realize that this is particularly a kind of surgery in which everyone develops his own method of work, and I trust you will bear with me when I say that the technique I describe is to point out *how I would do it* rather than *how you should do it*.

The operation in the neck, in a large percentage of the cases, is likely to be a clean one, undertaken merely to cut off the main blood stream somewhere below the jugular bulb, the point to be determined by inspection after exposure of the jugular.

As a consequence, if done at the outset, the surgeon and his assistants have not soiled their hands and instruments by working in the infected mastoid area and an aseptic wound is assured with less loss of time. The work may be completed in the neck and often closed and a dressing applied before the sinus wound is touched, thus assuring primary healing and a less conspicuous scar.

The neck is stretched over a sand bag, the chin being elevated and everted to the opposite side until the contour of the sternocleidomastoid shows plainly from the mastoid to the clavicle. The skin over the side of the face, neck down to the chest, is sterilized with a 5 per cent solution of iodin, which is afterward partially removed with 95 per cent alcohol to prevent blistering.

The initial incision is made from about one inch below the mastoid tip downward and forward across the anterior border of the sternocleidomastoid muscle to about one-half inch from the median line of the neck. It is carried through the skin and the platysma myoides muscle to the deep fascia. The external jugular in the line of this incision is clamped before dividing it, thus avoiding a troublesome and unnecessary hemorrhage. The skin and platysma incision is held open by blunt retractors. The deep fascia is incised almost perpendicularly along the border of the sternomastoid. All bleeding points are clamped and, if numerous enough to clutter the field, are ligated.

The dissection from this point is carried on entirely with blunt dissecting scissors and blunt dissecting forceps, in order that a clear view of the field may not be obscured by hemorrhage.

The muscle is dissected backwards and upwards until the jugular is uncovered for an inch and a half to two inches. The sheath is opened and the facial exposed as it enters the jugular.

By inspection and pressure with a finger or blunt forceps it is determined if there is an inflammatory thickening of the wall of the vein and if the vein fills freely from the facial when occluded above it; then, with the facial occluded if it fills from the bulb.

If collapsed above, or filled with a clot, or thickened by inflammation of its wall, the dissection is carried downward past the thyroid and even behind the clavicle until a normal appearing vein is found. Where the dissection has to be carried low in the neck the original incision may be carried, in a gentle curve, along the border of the sternomastoid, to the sternoclavicular joint, if necessary.

This rarely happens in my experience, however, and in such cases the shorter initial incision makes a much less disfiguring scar.

At whatever point the vein appears to be normal, leaving a wide margin for safety, ligatures are placed, a quarter of an inch apart, and the vein is severed between. The long ends of the lower ligature are cut close to the knot before the vein is severed, to avoid the accidental pulling of the ligature off from the distal end of the vein. The long ends are left on the upper ligature, fortified by a light clamp, to facilitate handling the vein while dissecting it from the bed.

In a large majority of my cases the clot had not extended below the jugular bulb. It was possible, therefore, to save the circulation through the facial and thyroid veins, and avoid a very long scar and the unnecessary mutilation of the neck by a dissection from the clavicle to the jugular foramen. In such cases this can be done without in the least jeopardizing the chance of success, which depends on cutting off the infected clot from the general circulation.

Where the clot or inflammation of the walls of the vein extends well down in the neck, as the dissection proceeds upward to the thyroid and facial veins, in the resection of the jugular they are secured by double ligatures, and divided between.

Inflamed cervical glands, unless they are broken down or mechanically impede the dissection, are not removed.

In a few words then, the vein is exposed without undue traumatism; inspected; ligatured at the highest point consistent with safety; and

resected from that point upward to a short distance from the jugular foramen where it is ligatured and cut off.

If the gross appearance shows that the phlebitis has extended into the neck, the wound is left open until symptoms of sepsis have disappeared, when a plastic operation is done to improve the appearance of the scar.

Otherwise, the wound is closed with a few catgut sutures in the deep fascia, and Michel clamps in the skin; the latter being removed in twenty-four to thirty-six hours.

The isolation of the thrombus in the proximal end, having been thus accomplished, the distal end is occluded in the following manner.

The sinus plate is opened over the sigmoid flexure at a convenient point below the knee by rongueur forceps and a sharp curette. From this point a wide gutter along the line of the sinus is made with a powerful rongeur forceps to a point at least one and a half inches from the knee of the sinus, or as much farther toward the torcula as is necessary to expose a normal sinus for at least one inch. Before each bite is made the sinus wall is gently separated from the bony plate with a curved diretor. At this point the bone is removed so that the full width of the sinus is exposed to view, and the sinus is compressed by a plug tucked under the bone. I have found that perfect occlusion can be most easily accomplished by means of a compress made from a piece of soft rubber sponge, cut down to the proper size.

This sponge is prepared by boiling a fine quality rubber bath sponge until it is sterile and then cutting it up into different sizes, which are kept in an antiseptic solution. At the time of using, a stout silk suture is tied around the middle of the plug and it is then fashioned with scissors to the right size and shape. It is easily tucked under the bone, does not cause as much trauma by pressure on the underlying brain, and by means of the string is easily removed, being assisted by a wriggling motion with a bayonet forceps.

The removal is made in twenty-four to forty-eight hours, leaving a perfectly sealed sinus. I believe it is important to follow the sinus back with as little traumatism as possible and insert the plug to compress the sinus before doing any more extensive work on the bone. Any possible breaking up of the septic clot and dissemination of it, through the circulation by the torcular route, is thus avoided.

Once the plug is in position the bony gutter may be widened, if necessary, and the rest of the plate over the sigmoid flexure down to the bulb removed. The thrombus is now bottled up. The only possible avenue of infection into the general circulation is by a backing up through the petrosals.

While theoretically this may occur, I doubt if it often happens.

The evacuation of the thrombus, to my mind, requires more judgment than any stage of the operation.

The whole field is thoroughly washed with hot salin solution and flushed with a powerful antiseptic. A slit is made on the outer wall of the sinus just in front of the compressing plug. An assistant compresses the sinus just behind the knee to prevent bleeding if the petrosals are not entirely blocked off by the thrombus. The lower blade of a blunt scissors is inserted into the slit and the incision is carried forward for about an inch to the compress. The opened sinus is spread apart and the interior of the vein examined for a clot or evidence of inflammatory thickening. The sinus is now packed with layers of one-half inch packing gauze, soaked in a powerful antiseptic, up to the end of the incision and the compression is eased sufficiently to determine whether the petrosals are bleeding or are completely occluded by an obliterating clot. Should there be no bleeding the incision may now be carried by means of the scissors throughout the sigmoid flexure to the bulb. The incision is spread open and the walls cut away on either side, leaving the obstructing clot in position until the external wall is completely trimmed away as near to the bulb as possible. The clot is now gently lifted out with thumb forceps or a dull curette. The internal wall of the sinus is not curetted.

The very fact that the patient has no meningitis shows that locally the tissues have erected a barrier to the infection, and drainage, plus antiseptics, are all that is needed to promote healing. The wound is packed with layers of antiseptic gauze and a wet dressing applied.

When on removal of the compress there is a profuse hemorrhage showing that the clot is a parietal one, I believe it is a great error to waste time and a large amount of blood in an effort to dislodge a clot. Instead of this the sinus wall is rapidly incised from the knee to the bulb, laid open and packed with layers of gauze soaked in an antiseptic solution.

From one to three days later the packing is removed and the clot and sinus walls are then managed in the same way as detailed in the completely occluded sinus.

The whole wound is packed wide open with repeated dressings for a week or ten days, when, if all constitutional signs of sepsis have disappeared, a plastic operation is done to close the wound and hasten healing.

May I add a word for completeness of the picture?

With the modern methods of blood transfusion from carefully indexed and immunized donors, one would be neglectful who did not give his septic case this additional help.

The day has gone by when blood transfusions are reserved for cases in extremis, and I believe many a case is helped over the hill by this measure nowadays which would have lost with the most skillful surgery unaided.

**Technique of Jugular Bulb Drainage.** Dr. John McCoy.

Drainage of the jugular bulb is sometimes imperative, when we are confronted with a condition of suppuration in the bulb following a preceding mastoiditis and sinus thrombosis.

In approaching this surgical problem there are several important factors to be remembered; these are:

1. The position of the bulb. It is deeply situated in the neck, directly under the floor of the middle ear and in close juxtaposition to the facial nerve posteriorly and inferiorly.

2. The size of the bulb. In more than 50 per cent of cases the bulb is very deficient or even absent on the left side.

3. The contents of the bulb. Besides the upper end of the jugular vein, it contains three large and important nerves which pass through it; namely, the pneumogastric, the glossopharyngeal, and the spinal accessory. The spinal accessory, being situated laterally, is most likely to be injured by manipulation when we reach the bulb.

Keeping these points in mind, there have been several methods advocated, each of which accomplishes the desired result with a varying amount of difficulty as a surgical procedure, and with a varying degree of safety to the surrounding structures, especially the facial nerve.

The simplest of these is the skin fistula method of Alexander, in which the margin of the resected jugular vein is stitched to the surrounding wound, and in this way a direct path of drainage is established from the bulb.

Another method devised by Piffl is as follows: After separating the membranous canal wall as we do in the radical mastoid operation, and pushing aside all tissues up to the Glaserian fissure, we remove the floor and part of the anterior wall of the bony external canal to the hypotympanum. Having gotten this far the upper portion of the internal jugular vein makes it appearance.

A method devised by Voss is as follows: After exposing the sinus and removing the bone over it, the lower part of the vein becomes more and more horizontal, the lateral wall of the sinus becoming the inferior. The lower wall of the sinus is followed by removing bone with gouges. By following the course of the vein with a probe, the distance of the anterior wall of the jugular fossa can be determined. Exposure of the bulb is accomplished by very cautiously removing the bony wall above the anterior boundary of the jugular fossa. (To avoid injury of the horizontal semicircular canal the bone is not removed higher than one-

half centimeter.) The posterior membranous wall of the bulb is readily exposed in most cases where we have a well defined bulb. After the posterior wall has been removed up to the roof of the bulb, it sometimes becomes necessary to remove the edge of bone which marks the separation of the sinus proper and the bulb. This shows the sharp knee from where the lateral wall of the sinus goes into the posterior wall of the bulb.

A method devised by Whiting is as follows: By using the posterior semicircular canal as a guide, all the diploic bone immediately below it is removed, and in so doing the posterior aspect of the bulb itself frequently comes into view. Now, taking as a guide the point of utmost curvature of the sinus posteriorly, he removes in a direction downward and inward the occipital groove and the jugular process of the occipital bone to a level which he considers is the lowest part of the sinus. He then removes the bone covering the bulb and knocks off the knuckle of the foramen lacerum posterior. This gives a splendid exposure of the bulb, and through this a catheter may be passed down through the portion of the jugular vein remaining in the neck.

Another method is that of Grunert's, otherwise known as the "gutter" operation, which is as follows: First, a complete resection of the tip of the mastoid. Then separation of the three muscles from the base of the skull, namely, the sternomastoid, digastric and spenius capitis. The soft parts are retracted as we work toward the base of the skull in a horizontal direction, in order to reach the jugular vein. The operative field is sometimes considerably narrowed by a prominent transverse process of the atlas. This may have to be resected, in doing so one must be careful not to injure the vertebral artery. The rectus capitis lateralis is now pushed aside in order to remove the last bridge of bone between the free margin, and the jugular foramen. The bulb is now split open from the sinus end. This concludes the methods of attacks by way of the mastoid.

There is another method of approach by way of the neck devised by Tandler. The mastoid incision and the incision for the jugular are converted into one. The sternomastoid muscle is separated for its entire length, and pushed posteriorly. We now search for the spinal accessory nerve; when it is found it is tied loosely with a suture, so that it may be in good view during the operation. We follow the course of this nerve to its exit at the jugular foramen. The finger is now passed deeply into the wound, and we find the space between the styloid process and the mastoid process. Here the exit of the facial nerve through the stylomastoid foramen may be exposed. The digastric muscle is separated from the digastric fossa and pushed forward and downward. If we work on a line below the stylomastoid foramen and this muscle, there will be no danger of injuring the facial nerve. After pushing aside the digastric muscle the occipital artery may be ligated in two places and cut out. The jugular vein may now be separated from the margin of the jugular foramen, which can be felt with the finger. Now loosen the uppermost portion of the vein after pushing aside the periosteum at the base of the skull, and the rectus capitis lateralis. The bone is now removed from the sigmoid sinus to the bony margin of the jugular foramen, and the sinus bulb and vein are split wide open.

In conclusion, the writer believes that the most complete and well defined of the operations, which approach the bulb from the mastoid cavity is Whiting's. This operation, however, is not possible in all cases, especially those where the mastoid process is short and deep, or where the sinus is far forward. It is also our belief that the operative approach by way of dissection in the neck is applicable in all cases, and gives us the maximum of safety in avoiding traumatism to the facial nerve.

DISCUSSION.

DR. RAE expressed the pleasure he had experienced in listening to these three papers on sinus thrombosis. Unfortunately, there was little ground for discussion, since all would agree in the main with everything that had been said by each of the speakers.

It is quite important that shock be reduced to a minimum and for this reason there should be as little delay as possible in handling a thrombosis case as is consistent with thorough work.

Usually he himself is accustomed to regard all cases of sinus thrombosis as being properly divided into three classes: 1. The type of case met in hospital service, where the patient has been sent in for immediate operation and where in the course of the mastoid operation one discovers or suspects sinus thrombosis. 2. The case on which a mastoid operation has already been done and in which sinus thrombosis is suspected, without supporting laboratory evidence. 3. The case in which from all the evidence available one has made the diagnosis of sinus thrombosis.

In the first type on which one stumbles, so to speak, one does not feel at liberty to ligate or excise the jugular without determining so far as possible that the patient actually is suffering from thrombosis. The only way to do that is to explore the sinus. In such a case he makes a very free exposure of the sinus and opens it and if he determines then that he is dealing with a clot, he immediately stops work on the sinus and goes down and does the vein work; then goes back to the sinus.

In the second class, in which a sinus thrombosis is suspected, after a mastoid operation has been done, the procedure is practically the same: first of all expose the sinus freely, open it and if a clot is found leave the sinus alone, do the neck work and then, lastly, go back to the sinus.

In the third type of case in which the diagnosis of sinus thrombosis is made beforehand, he exposes the sinus completely but does not open it, then goes down into the neck and ligates or excises the jugular as the case may be and, last of all, goes back and opens the sinus as Dr. Duel had described.

There are one or two points to be considered. In exposing the sinus, Dr. Duel had spoken of separating with a grooved dissector and with a curette and biting away with the rongeur. Dr. Rae said he had given up that method a good many years ago, and now exposes the sinus with the widest gouge he can use.

Every otologist with sufficient experience must some time have opened the sinus accidentally. The danger of this is reduced to a minimum by the use of a wide gouge. The exposure can be made quickly and with the greatest degere of safety. The bevel on the under side of the gouge acts as an elevator and the instrument can be used over the exposed sinus, provided that it be wide enough to straddle the opening. In opening the sinus one must be very careful to open only the outer wall and this is sometimes not very easy, especially if we are handling a collapsed sinus. Should the deep wall of the sinus be opened one runs serious risk of a brain hernia.

Dr. Tobey in his discussion states that he is unable to think of a reason for excising the jugular vein. In a recent case in which there was doubt as to the presence of sinus thrombosis, but in which the clinical evidence seemed to call urgently for ligation of the jugular vein, a small part of the vein was removed between ligatures. Culture of this small part failed to show any growth and microscopical examination exhibited a normal vein wall. Surely this was testimony that could not be obtained without removing a part of the vein.

Dr. R. T. Atkins said that the subject had been so thoroughly covered by the readers of the papers and also by Dr. Rae's discussion that he was not able to add anything of importance. He had noted with interest, however, that the technique of the various procedures varied according to, perhaps, the hospital with which the operator was attached. Everyone is influenced by the technique of his hospital associates; that also holds true for parts of the country outside of New York. For example, in a nearby city, the technique for sinus thrombosis consists of one particular operation to the exclusion of any other. The general surgical principles involved art the same in each case; the indication for operation is the same. The aim is to remove from the

lateral sinus the jugular bulb and internal jugular vein the septic material and to shut it off from the general circulation. If one looks over the statistics of the various operators he will probably find that the percentage of recoveries does not vary a great deal, and it would seem that the type of the operation is not so important as the time of the operation. Early diagnosis and early removal of the focus of infection will probably reduce the mortality to a greater extent than the particular type of operation or the particular operative technique. Dr. Atkins said that this, of course, was not in line with the subject of the papers, but, as he had already stated, that had been so thoroughly treated that he could not add anything.

DR. GEORGE TOBEY, JR., said that the papers had been very thorough and it was impossible to go into any discussion of them, but that he wished a little elucidation on one or two points that had been brought up. The horizontal position had been a pet of his for about fifteen years, and about thirteen years ago he had presented pictures and charts in this very room showing the slight deformity following this operation. The technique as carried out in Boston is to have the patient on the table lying on the back with the head slightly downward, and then, while the patient is still in that position to select the wrinkle nearest the thyroid and with a sharp knife simply scarify it. The patient is then turned back to the other position and the deep incision is carried out through the platysma, first locating the external jugular vein, making the incision only one of one and one-quarter inches in length. As soon as the incision is made through the platysma, the remaining resection is readily carried on with the Mayo scissors. It is rather amazing the amount of room one can get through the horizontal position.

Dr. Tobey said they had been doing that for over fifteen years, and as yet had found no reason for changing it. It is very simple if you find the clot extends below the facial, either to make this incision a little longer or to go below and make a similar incision or a vertical incision below; but it is only very seldom that you find the involvement below the incision, and that incision will also bring you to about where the facial vein comes in.

Another point which he had not quite understood was the persistency of cutting the jugular. For years that had seemed to him a more or less unnecessary procedure. By taking two ligatures and causing alternate pressure on the upper or lower you can very readily determine the question of patency of the vein. Before ligating, with one or two ligatures and leaving them, he could not see the object of cutting the vein, for it left an opening and the possibility of infecting the neck immediately. It also opens up the possibility of the patient's vomiting or being restless and having these ligatures slip. Dr. Tobey repeated that he could not see the advantage of cutting the vein after tying it.

Recently he had been making some observations, one of which he wished to put on record; that is in the question of a double mastoid with lateral sinus symptoms: which lateral sinus is infected? Recently he had been carrying out observations in placing the manometer either in the cisterna or in the lumbar region. In a case where he had ligated the jugular vein and obliterated the lateral sinus, by pressing over the region of the jugular vein on the side operated, there was an increase of relatively about 10° in the spinal fluid, but the moment the pressure was applied to the unoperated side the pressure immediately arose so that it spurted out of the manometer which carried 280.° It did it invariably. That was repeated for ten days, and after drawing out 40 c.c. of fluid—the case having meningitis at the time—the relative degree of pressure was very marked, no matter how much it was reduced in the spinal cord. It was true in the cisterna and in the lumbar region.

Referring to the question brought up by Dr. Duel—that he doubted very much whether the petrosals filled with thrombus following thrombosis of the lateral sinus—Dr. Tobey said they had carried out a number of autopsies. This case referred to also went to autopsy; the sinus was obliterated three weeks before death, and on autopsy it was found

that beyond the point of the sinus thrombosis, towards the torcula, there had been on extension of the clot, and the intima was smooth. It was also found (and the same has been observed in other cases) that there was an almost film-like blocking of the distol ends of the superior and inferior petrosals, and practically free fluid blood throughout the remaining course of the petrosals.

An internal pachymeningitis on the inner aspect of the infected sinus is very seldom found.

DR. DUEL spoke briefly about the method of plugging the sinus in the posterior fossa. As all know, the sinus is easily compressible in that location. For many years he had used a plug of rolled gauze, as is usually done, but about five years ago the idea occurred to him to use a cylindrical-shaped roll of rubber sponge that had been thoroughly sterilized by boiling and fashioned for each case at the time of using. He had learned that by using a fairly large plug—as large as the end of the little finger and making compression by crowding it between the outer wall of the sinus and the overlying cranium, it occluded the sinus much better and with less pressure on the brain. He had not meant to imply that in every instance this rubber plug could be removed in twenty-four or forty-eight hours, but stated that he had done this several times and found the sinus blocked off perfectly, so that he could with perfect safety replace the plug with a loose gauze packing instead of maintaining very hard pressure for a number of days. The various instruments that have been devised to occlude the sinus had not in his hands been as satisfactory as this rubber plug. He wished to reiterate that he had simply told how he *would* do the operation, not how others *should* do it.

DR. WHITING expressed his interest in the papers that had been presented and said that one or two very practical points had been suggested which might be still further considered. He had been very much interested in what Dr. Duel had said about removing the plug at the torcular end of the wound within twenty-four hours with the assurance that he would not encounter hemorrhage from the torcular side. Dr. Whiting said that he had had some very unfavorable experiences in that matter. In three cases he had had bleeding on the eighth, twelfth and sixteenth days after the operation, from the torcular side, notwithstanding that there was a very firm and obstructing plug in place. In consequence, as a control and as a measure of greater safety it has been his practice ever since, after plugging off the sinus toward the torcular side and after the contents of the sinus have been removed to apply with a cotton tipped probe a solution of 1:500 bichlorid to the visceral and parietal wall under the plug which holds these two walls in contact; there is set up immediately an adhesive inflammation which has served to avoid the unpleasant experiences previously encountered a good many days after operation. With the use of this simple device he had no longer had any bleeding after removal of the plug.

Having questioned Dr. Duel's procedure, Dr. Whiting said he wished to ratify the observation that not too much time should be expended in an effort to clean out the parietal clot. When you have plugged off the torcular side and have control of the jugular bulb, if you open the sinus and find only a parietal clot you may get a good deal of bleeding, and the patient will lose a great deal of blood, which he can ill afford. It is a matter of great importance simply to open the sinus and plug it properly rather than to exsanguinate the patient during the attempt to remove the parietal clot. The clot can be removed subsequently with small loss of blood.

Dr. McCoy had referred to a procedure in reference to the extirpation of the jugular bulb on which Dr. Whiting said he had been working for two or three years, with the object of modifying or minimizing the tremendous operations which have at times been considered necessary in consequence of unsuccessful operations for sinus thrombosis where the clot has been cleaned out in the sinus and the jugular has been either resected or tied, as the case may be, but the patient instead of

going on to a favorable recovery continues to show septicopyemic manifestations. When the dressing from the bulb is removed and pressure made under the angle of the jaw pus wells up from the wound. Dr. Whiting said he had seen a case not long ago where on slight pressure a dram or two of pus came out. Such a case as that cannot get well unless adequate drainage of the bulb is established. The operations Dr. McCoy had referred to, the Gruenert and Tandler operations, are very formidable procedures. Dr. Whiting said that he had tried the operations frequently on the cadaver and considered the latters especially a very formidable procedure; and for that reason had devised the method he now uses.

In the ordinary mastoid, as encountered, with well developed pneumatic cells and a broad process, there is ample room to do the procedure. Occasionally when the mastoid is very narrow, where the sinus lies far forward close up to the posterior wall of the bony meatus, one does find extreme difficulty in the procedure. In fact, in one case performed on the cadaver not long ago, a negro, Dr. Whiting said he could not get into the jugular at all, but ordinarily if there is a space of half an inch between the posterior boundary of the sinus as it curves around toward the bulb and the anterior boundary of the mastoid process, *i. e.*, premastoid lamina, the operation can be done without much difficulty. Suppose the sinus has been operated upon in the usual way and the case has not done well. A vertical line is made on the bone beginning on the convexity of the sigmoid groove just below the knee of the sinus and is extended thence downward through the occipital groove and into the jugular process of the occipital bone; all the included bone is removed and a moderately wide surface of the cerebellum exposed posteriorly; this gives ample space in which to cut away the bone forward toward the jugular bulb, either with chisel or bent rongeur, such as Dr. Bacon devised. This measure permits approach to the bulb.

The next step is to remove with a curette all the diploic structure which lies immediately below the semicircular canal. This is the important step. In bones of the pneumatic type this structure is very easily removed. Curette out the diploic bone beneath the posterior semicircular canal, and it will be exposed as plain as if produced in a wax model. You then have the jugular bulb immediately beneath a thin layer of bone. Then, with a chisel, break through that lay of bone and you are in the jugular bulb. It is no longer a question of approaching the bulb, you are in the bulb. The lower border of the posterior semicircular canal is slightly below the level of the floor of the tympanum. Consequently when you have fully exposed this structure you are immediately over the bulb and you can go easily into it. In enlarging the opening of the bulb care must be exercised not to injure the aqueduct of the vestibule, which lies in very close proximity to that part of the field.

Dr. Friesner said that the procedure which Dr. Rae had ascribed to him and which he had tried a few times on the living and about thirty-five or forty times on the cadaver, was a very simple one, and in the instances where it had been carried out on the living it had been found quite adequate. It does not give one the approach to the bulb that Dr. Whiting's operation does, but in the cases where it had been used it proved adequate. It is a complete exposure of the lateral sinus and enables one to look into the bulb. Dr. Friesner said he had demonstrated this before the Trilogical Society when it met in New York, and showed that we were a centimeter behind the bulb and passed a probe down into the bulb. One is not far behind the bulb in this procedure, but is not always possible to do. It depends upon the angle at which the sigmoid sinus crosses the lateral lobe of the cerebellum. It is the same procedure that is done in the Grunert operation. It appears that the Grunert operation endangers the facial nerve. Dr. Whiting's operation to some extent endangers the facial nerve; but you can do a complete dissection of the sinus by first removing the tip and then follow the sinus around and you can approach to the bulb with an adequate

exposure of the bulb and curette it without in any way endangering the facial nerve.

Referring to Dr. Tobey's remarks, Dr. Friesner said he was aware of Dr. Tobey's work and its presentation before the Section some years ago; but in this operation the vein is ligated at the omohyoid. About fifteen years ago he and Dr. Thompson studied this question and since then they had done about a hundred cases with the average results. In only two or three of these had it been necessary to resect after the ligation of the omohyoid, and the fear of re-establishing a circulation had always led him to cut the vein. Occasionally he simply ligated it, but he believed it wise to ligate with a double ligature fairly well separated.

Dr. McCoy said he had only a few remarks to add: In the first place, drainage of the bulb is an exceedingly rare necessity, and it is doubtful if any one otologist saw it more than half a dozen times in his life; but at the same time, when such a thing as suppuration in the bulb does occur and one is confronted with the problem of draining it, one gets very little help from the general surgeon, and it is up to the otologist to solve the problem.

He said further that he had stated his conclusions at the end of the paper, *i. e.*, that Dr. Whiting's method when available was the best, but that it is not always applicable. The method of dissecting from the neck up to the mastoid and finding the spinal accessory nerve offers a method which can be employed in every case. If he had succeeded in focusing attention on the possibility of such a condition and the means of remedying it he was greatly pleased. He certainly had enjoyed the other papers in the symposium very greatly.

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SECTION ON LARYNGOLOGY AND RHINOLOGY.

*Regular Meeting, December 29, 1924.*

**Tuberculous Ulceration of Tonsil Associated with Pulmonary Tuberculosis.** Dr. Robert C. Howard.

This patient is presented because of the relative rarity of frank, gross tuberculous lesions of the tonsils, and I am indebted to the Chairman, Dr. Francis White, for bringing to my attention a recent article by MacCready and Crowe, which covers the subject of tuberculosis of the tonsils and lymphadenoid tissue of the nasopharynx. They review the literature quite thoroughly and their own statistics are based on routine microscopic examinations of all adenoid and tonsillar tissues removed at the Johns Hopkins Hospital since 1912.

Out of a total of 3,260 examined, 138 or 4.18 per cent showed tuberculosis of the tonsils or adenoids and was four times as common in colored as in white persons, and 85 of the series had tuberculous glands of the neck and 48.2 per cent of these showed tuberculous lesions in the tonsils or adenoids. These authors are in substantial agreement with Mitchell in England, and Parks and Krumwiede in New York, that this type of microscopic lesion is of bovine origin and that gross ulceration of the tonsil is practically always secondary to pulmonary tuberculosis, the former being largely based on the fact that over 50 per cent of these microscopic lesions are in persons under 10 years of age and further they believe that it is not advisable to alarm the family and stigmatize as tuberculous the patient by telling them of the character of these minute lesions since the majority of such patients will probably never have clinical symptoms of the disease.

The patient, a man aged 36 years, steamfiitter's helper by occupation, came to Dr. MacKenty's clinic at the Manhattan Eye, Ear and Throat Hospital nine weeks ago complaining of pain for the month previous on the left side of his throat in the region of the left tonsil, aggravated

by swallowing and attended with some cough of a slightly productive character and some loss of weight.

No history of tuberculosis in the family. He had measles, whooping cough and diphtheria in childhood, but nothing since till onset of present illness.

On admission the left tonsil was the seat of a deep punched out ulcer with smooth margins and moderately indurated borders, but gave the impression of being limited by the capsule and noninfiltrating. The appearance was very much that of the tonsillar fossa four or five days after enucleation with a part of the tonsil left at the lower pole. Cultures taken were negative for diphtheria bacilli, but showed streptococcus mitis, staphylococcus albus and micrococcus catarrhalis. Smear was negative for the fusiform bacillus and spirillum of Vincent. Section removed from margin of ulcer showed hyperplastic lymphoid tissue with numerous miliary tubercles containing multinuclear giant cells and areas of caseation necrosis.

Diagnosis: Tuberculous lymphadenitis.

The Wassermann reaction was negative. Physical examination of the chest showed diffuse areas of subcrepitant rales with slight changes in resonance, breath sounds, and voice. Diagnosis: Diffuse pulmonary tuberculosis.

X-ray plates of chest showed diffuse infiltration of lungs, suggesting tuberculosis.

Sputum: Films contain numerous tubercle bacilli. Cultures made from sputum show profuse growth of a long chain hemolytic streptococcus and the staphylococcus albus. The temperature varied between 98 and 100° F. The pulse was correspondingly increased.

He was placed on a high calorie diet, including four quarts of milk daily, also eggs and other nutritious food. Malt extract and cod liver oil, one tablespoonful three times a day, was prescribed, also hygienic and sanitary precautions were enjoined.

Topical applications of weak silver and iodin preparations were applied to the ulcer. He has had two transfusions of 600 c.c. each. Since starting treatment he has gained thirteen pounds in weight, feels and looks better, is stronger, has less pain and cough, and the ulcer, although about the same size, shows a tendency to heal in places.

Reference: P. B. MacCready and S. J. Crowe, *Am. J. Dis. Child*, 27: 111, Feb., 1924.

**Partial Resection of Maxilla for Carcinoma.** Dr. Gouverneur M. Phelps.

The patient was an Irish girl, age 29 years, whose family history was irrelevant. In September, 1923, she had a submucous resection performed, and this was followed by a septal abscess. On June 13, 1924, she was seen in Dr. Harmon Smith's clinic suffering with nasal obstruction on the left side, accompanied with a foul discharge. Examination showed a large soft growth, filling the left side of the nose and nasopharynx. X-ray examination showed the left frontal sinus to be of average size, with severe involvement; the left ethmoids and antrum were also severely involved. The right frontal, ethmoids and antrum were involved mildly. The sphenoids were clear. The condition was reported to be a chronic polypoid sinusitis. On June 18, a section of the tumor was reported to be adenocarcinoma. The Wassermann reaction was negative.

On July 2, the patient was operated upon under gas and ether anesthesia: The upper jaw was partially resected, and the ethmoids and sphenoids were removed together with a large mass of soft growth. The outer wall of the antrum and the floor of the orbit were not removed. The carotid artery was not ligated. The hemorrhage was slight and easily controlled by packing. The wound was packed with 1 per cent formalin gauze, and the skin was closed with horsehair.

On July 10, 50 mg. of radium were inserted into the left nostril for sixteen hours. In all, the patient had six applications of radium, this

being inserted in the nostril, on face, and in the submaxillary triangle of the neck.

The tumor removed proved to be adenocarcinoma, very cellular, with active mitosis.

DISCUSSION.

DR. G. A. ROBINSON said the best way to make the application of radium in this type of case is after the removal of the growth. A preliminary irradiation may be advisable to restrain the growth and to lessen the hemorrhage by the effect on the blood vessels. Radical removal of a carcinoma of the antrum followed within a few days by thorough irradiation will give the best end results.

DR. VOISLAWSKY congratulated Dr. Phelps on the beautiful results obtained, and then inquired concerning the statement made that there was not much bleeding. Dr. Voislawsky said that he himself had always had a good deal of difficulty with the bleeding in such cases, and he hoped that Dr. Phelps be a little more explicit in stating why he did not ligate the carotid any more "on account of infection".

DR. WHITE said that he also had been impressed with the fact that Dr. Phelps did not ligate the carotid. In the last case of the kind operated at the Manhattan Eye and Ear Hospital, he did not ligate, although the ligatures were put *in situ* in the wound so that in case of hemorrhage it could be ligated promptly. The ligatures were removed a day or two after the operation, and there was no more disfigurement than with the ordinary incision.

DR. PHELPS, replying to Dr. Voislawsky, said the cases bleed freely but never dangerously; the danger was not very great, and if you want to control it you would have to tie both sides. The wound is infected from the one above by way of the lymphatics, and after the neck wound is apparently healed, it often opens and drains pus, and leaves a disfiguring scar, and it always takes longer to heal than the wound in the face.

**Tuberculosis of Nasopharynx.** Dr. Gouverneur M. Phelps.

The patient was a young woman from Dr. Harmon Smith's clinic who was operated upon on Sept. 15 for a mass of what clinically was considered to be tuberculous glands of the neck. This was proved by pathological examination. As she had large and diseased tonsils and a very large adenoid, she was advised to return later and have these removed. The lungs were clear, and the Wassermann reaction was negative.

On Dec. 1, under general anesthesia, the tonsils were removed, and at the same time what seemed to be an ademoid proved to be a large hard mass filling the nasopharynx. This was movable on the deeper structures, and was readily removed by sharp dissection.

Dr. Phelps said he considered the nasopharyngeal lesion to be the primary one, since it was typical of an old and healing lesion, while that of the neck was an extending and breaking down one.

DISCUSSION.

DR. HARRIS told of a case reported from Dr. Chappell's clinic some years ago, a case of primary tuberculosis of the nasopharynx, and said he was interested to know whether Dr. Phelps regarded this as a primary case.

DR. HOWARD inquired whether the patient had any tuberculous infection in the tonsils.

DR. WHITE said that sometimes an inordinate hemorrhage occurs after an adenectomy and at other times there is practically no hemorrhage at all. Recently a case in which apparently a severe hemorrhage occurred after adenectomy, a postnasal plug was used and left *in situ* for a very long time. The patient came to the Manhattan Eye, Ear and Throat Hospital and is still there suffering from acute mastoiditis and complications, but improving.

DR. HAYS said that primary tuberculosis of the throat, particularly ulceration of the tonsils, was extremely uncommon. The point that impressed him most was the necessity for differentiating the various

types of ulcers seen on the tonsils; it was surprising to note how many mistakes are made in them. The same might apply to tumors of the nasopharynx. Often when operating for adenoids one encounters soft tissues that might be the site of some pathological condition in the nasopharynx. He had seen two cases recently, neither of which was tuberculous. One of them had been treated by a prominent laryngologist for diphtheria for two weeks, although no bacilli were found. This patient had an ulcer looking very much like the one shown this evening, and it was a question whether it was tuberculosis, syphilis, or a malignant condition. Finally a four plus Wassermann reaction showed it to be syphilis. The other case was also very interesting. The laboratory reported the Wassermann reaction to be negative; the biopsy specimen was reported not malignant. It was a question whether it was tuberculous or not, although no tubercles or giant cells were found. Fortunately the patient had a relative who was a doctor, and another examination blood test was made, which was reported positive. So when one gets a negative report and cannot find definite evidence of tuberculosis, it is well to have a second Wassermann test made.

DR. WHITE said that the remarks made in regard to these conditions were very important, for every once in a while a disagreeable situation arises. This patient had been under treatment and a complete tonsillectomy had been performed before coming under my care. The adenitis was bilateral. There was nothing to show the cause—nothing in the teeth, no ulceration in the pharynx or nasopharynx. A Wassermann test was suggested, and there was the usual scene, and protests, but he insited that if he was to treat the case the patient must have the test made, and the report came back four plus. Such cases often fall into the hands of men who remove the glands, but that does not relieve the underlying cause.

DR. PHELP: said that as soon as the mass in the neck was opened, a quantity of caseous material was evacuated, and the rest of the glands showed yellow foci scattered through them. The tonsils were examined and were not tuberculous. Many years ago in the Roosevelt Hospital Dr. Hodeuful and himself had sanctioned a thousand tonsils, to find out how often tuberculosis was present ,and in that number only twelve were found and these all had tubercular glands of the neck positively diagnosed. That was before the Wassermann test was used. This girl apparently had a pharyngeal lesion that was apparently a primary one, for it was in a very fibrous stage.

As to the ligation of the carotid, Dr. Phelps said that he had done two resections of the jaw in which he had ligated, and one evening at the Academy he had listened to some cases reported from a general surgical clinic, and the question of ligation came up, and the consensus of opinion was that the extra time, loss of blood, mutilation, and danger of subsequent infection in the neck wound did not warrant the ligation or even the section of the neck.

With the compression of the carotid, accordingly the next time he had a suitable case he had omitted the ligation and found it very satisfactory. (Described the method used.)

The suction apparatus was used, as in tonsil cases, and the head was kept way back. The best way is to put the tracheal tube in the larynx and pack it; that makes it very much safer. Then, in cleaning it out, he used moistened gauze, dipped in 1 per cent formalin, leaving it in place while the operation was proceeding until he was ready to remove it; later the whole thing was packed solid with 1 per cent formalin gauze. This was removed after forty-eight hours, and it was perfectly sweet. He knew of no other method which would give so satisfactory a result.

DR. WHITE said that in the case he had referred to he had used hot sterile saline solution only—no formalin.

DR. HOWARD said that when the patient first presented himself tuberculosis was not seriously thought of. The slight induration suggested the possibility of epithelioma, and a section was removed for examination, which proved to be tuberculous.

**Case of Hodgkin's Disease Involving the Nose and Throat and Showing Radium Burn, Now About Healed.** Dr. T. J. Harris.

This little patient has been presented before and is now presented again with reference to a complication encountered, a radium burn following the application of radium in the throat. She is 13 or 14 years of age, born on the other side and has been living in this country for two or three years. A year after she arrived she developed a soreness of the throat with swelling, and she went to the pediatric clinic at the Post-Graduate Hospital, where radium was applied, followed by disappearance of the swelling. I did not see her at that time.

Six months later she came to the Throat Clinic complaining of nasal obstruction and total inability to breathe through the nose, the obstruction being more marked on the right side. In view of the bleeding and the age, the picture was diagnosed as a case of sarcoma. A biopsy was made, and the report came back not sarcoma but malignant lymphosarcoma. Feeling somewhat doubtful, and there being complete darkness on the right side of the face with the X-ray showing involvement on that side, the antrum was explored but was found to be virtually negative. Later, under general anesthesia, the tissue on the right side of the nose was removed as thoroughly as possible, but not completely so; the growth was again submitted to microscopic examination and the earlier report was confirmed; *i. e.*, Hodgkin's disease. A third operation was then performed, and the growth further removed and radium applied in the nose at least three times, with no reaction whatever. The case was seen by the medical men, who also made the diagnosis of Hodgkin's disease.

There was absolutely nothing in the throat, and until this fall no appearance of any growth in the throat was manifest, when I discovered a large mass on the posterior pharynx wall rapidly extending to the left side. The mass consisted of soft tissue, not bleeding easily, and was beginning to interfere materially with deglutition. In the light of the condition in the nose and the previous history of the growth in the throat there was little question in regard to the nature of the disease manifesting itself there. This seemed to be an admirable case for the application of radium, but instead of employing it as has been done on previous occasions, we made use of the radium emanations, 204 mc. hours (23 mg. something over eight hours).

When seen two days afterward, she complained of difficulty in swallowing, and examination of the throat showed a large ulceration over the whole area of the application of the radium and around it. This extended rapidly until the ulceration was about half an inch in diameter. Topical treatment was instituted; the pain was not complained of severely. At that time the burn seemed to be at its height, for it began to improve, and anyone looking at it now would have difficulty in determining where the burn was. The patient looks well, is feeling well, and is swallowing well.

There has always been difficulty in confirming the microscopic and medical diagnoses from the findings in the nose and throat, for the patient is so well and continue to be so. The case is presented with especial reference to the liability of burns from radium emanations. I have inquired about this from those who know and have been told that such burns are occurring all the time, and that others are making the same mistake that we made, using it in the same strength as the radium salt. As one specialist said: it is at least four times as powerful as the radium salt and should therefore be used four times as weak. It was used in this case as the salt is used, burying the needles. The case is presented with the hope of forestalling or saving others from the same unpleasant experience, which fortunately, did not give as serious results as was at first feared.

**Septicemia Following Furuncle of the Nose.** Dr. T. J. Harris.

I should like also to report briefly another case which I hope to report later in full.

The patient is a young girl who developed in the right ala an ordinary furunculosis, with swelling and pain. At the end of three or four days she went to a local physician, who did what is so common—incised it, expressed the purulent matter, and sent her home. The third day following she developed a temperature of 104-5,° and was referred to the hospital. When admitted, she had a temperature of 105,° and was rather flighty, suggesting the possibility of meningitis, with some swelling and redness above and below the right eye. Dr. Forbes saw the case for me and immediately curetted the incision into the cheek and drained the nose as thoroughly as he could. At first the blood was absolutely free—no organism could be found—and it must have been fully a week before a staphylococcus was found in the blood. In the meantime pointings were found above and below the eye and in the cheek; and during the time she was in the hospital she must have had a dozen incisions in and around the cheek for drainage, and metastases occurred in the ankle without drainage; she developed a septic pneumonia and a septic heart. Her life was saved, as all agreed, in spite of the fact that she had two transfusions, by the free use of mercurochrome, four injections in all. According to the recommendation of Hugh Young in his article in the *Jour. A. M. A.*, last spring, we used it intravenously, giving 23 per cent of the body weight of a 1 per cent solution. She had 26 c.c. each time. The medical men were very chary of using it, being particularly afraid of the risk of an acute nephritis. The urine was watched carefully, and there was never a trace of albumin in it. Immediately following the use of mercurochrome there was a favorable response, and the blood would clear up; as soon as it became septic again the mercurochrome was repeated. We fought it and fought it, and kept on draining out the areas of pus, which fortunately were superficial. Finally, in spite of our fears of meningitis, and cavernous sinus thrombosis, etc., we avoided all such complications and the patient was discharged two or three weeks ago, after nearly two months in the hospital.

This case illustrates the imminent danger of meddling with a furuncle of the nose. The anatomical conditions are well known, the absence of valves in the veins, the direction of the blood supply, and the opportunity thus of the injection getting up into the brain. There are probably more cases of the kind than we have any idea of, and doubtless many cases of sinus thrombosis develop from such conditions. The general surgeons say that squeezing and pressing in such cases is contraindicated. If you have a desperate case of septicemia, where blood transfusion does not do all you wish, do not hesitate to use mercurochrome. The use of the two together is not contraindicated.

DISCUSSION.

DR. HAYS said that such a case should not be allowed to pass without comment, but he had been wondering whether or not the result secured would be permanent. The treatment was exceedingly interesting. The case brought up one very important point: how often cases are observed from only one standpoint, without thinking that the condition treated might be part of a general condition, as a leukemia, for instance. It is very infrequent for a specialist to have a blood count taken. Also, when one finds palpable glands in the neck which suggest possible conditions in the nose, one should examine the axillae, etc., and find out whether other glands are involved.

Dr. Hays said that a case of this kind was of particular interest when recalling the remarks of Dr. Gordon New at the recent Congress of Surgeons, in telling of cases where the glands of the neck were operated upon by the general surgeon without investgating the nose and throat conditions—the glands were removed, and that was the end of it, so far as the surgeon was concerned; it took the nose and throat men to find out that was a malignant condition of the nasopharynx. Cases of this type should make one look carefully into the general condition.

*To be Continued.*